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COMMUNICATIONS

REPORT OF FORTY-EIGHT CASES OF MARGINAL BLEPHARITIS TREATED WITH PENICILLIN*

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MARGINAL blepharitis is a relatively common and particularly intractable inflammation of the lid margins, usually attributed to infection with *staphylococcus aureus*. In the past a variety of treatments have been tried, including the application to the lid margins of ointments (*e.g.*, hyd. ox. flav., ung. hyd. am. dil., ung. zinc et ichthyol., ung. sulphonamide, etc.), of dye solutions (*e.g.*, liq. tinct., mercurochrome), of mild antiseptics (protargol, argyrol), and of caustics (1 per cent. silver nitrate and 0·5 per cent. dilute carbolic). Combined with these treatments epilation of the lashes, autogenous and stock *staphylococcus aureus* vaccines, staphylococcal toxoid, correction of errors of refraction, vitamins, and removal of septic foci have also been recommended. Treatment of the usually associated seborrhoea capitis is also considered essential by many observers. The multiplicity of treatments alone indicates the intractable nature of the disease. It tends to improve under all or any of them for a time, but usually shows frequent relapses and may pass easily into a chronic stage which may be life long.

The following investigation was carried out in order to test the

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clinical value of penicillin in a well established infection due to an organism known to be sensitive to its action. As chronic blepharitis supplied these requirements and is known to be an intractable condition, it provided an ideal field in which to test the efficacy of treatment with this drug, as well as its use in one of the commonest external diseases of the eye. Throughout the investigation clinical signs were correlated with bacteriological findings.

The work was carried out as follows: Forty-eight cases from the Out-patient Department of the Oxford Eye Hospital were treated. These cases were taken as they presented themselves, in other words, there was no selection. The youngest was aged three and a half years, the oldest 77. Twenty-six of the patients were under the age of 20 and 11 were over 40.

The type of blepharitis varied. Thirty cases were definitely ulcerative in type, 17 were squamous and one was complicated by corneal ulcers.

The duration of the lid infection before commencing penicillin treatment, though not necessarily continuous, varied from three weeks to 32 years (see Table I).

TABLE I.—*Duration of Symptoms*

	Total	1–2 mos.	6 mos.–2 yrs.	5–15 yrs.	Longer
No. of cases	48	5	27	8	8

As only five had a history of less than two months, the bulk of the cases could be considered as having reached a chronic stage. The usual history was of continuous soreness kept in check by treatment (nature immaterial) and of relapses after treatment was stopped. In some cases there had been remissions at intervals; in a few only was there a history of two distinct attacks separated by a long interval. Most of the cases had had long periods on the standard treatments mentioned in the first paragraph.

Bacteriological investigation.—All but seven cases were examined bacteriologically before treatment began. The results were as follows:—

Staphylococci cultured before treatment with penicillin.

Staph. aureus (Coagulase positive) in	39	cases
Staph. albus (Coagulase negative) in	2	,,
Not done	7	,,
	48	,,

Staph. aureus was usually found in pure culture, but occasionally in combination with *Staph. albus*, *Neisseria catarrhalis*, or diphtheroid bacilli. Further bacteriological examinations were made weekly or fortnightly and only after no drug had been applied to the lids for a minimum of 24 hours. It was hoped to continue these examinations a week, a fortnight, a month, and finally a year after apparent recovery had taken place, but the numbers reporting after these periods of time necessarily dwindled, so that later records are only a proportion of the whole.

Treatment.—The treatment was carried out by the patients themselves. They were each given a weekly supply of a few grams of ointment containing 600-800 Oxford units per gram. This was made by dissolving the requisite amount of penicillin in a few drops of sterile distilled water and beating this up, under aseptic conditions, with sterilised vaseline. Each patient was instructed to apply a small quantity of this on the lid margins with a wooden probe, rubbing it in with the latter. When possible this treatment was carried out three times a day and always just before retiring to bed at night. Instructions were given to keep the box of ointment in a cool place and covered up. No adjuvant treatment was given and very few lashes were epilated.

Assessment of progress.—This was made in the first instance on clinical and secondly on bacteriological grounds. Recovery was not considered to be complete until the lids looked normal and no *Staph. aureus* could be cultivated from them a week after penicillin had been discontinued. An exception to the clinical criterion had to be made in cases of many years' duration where scarring of the lids prevented a return to complete normality. In all instances, however, the bacteriological findings were the final criterion of recovery, as the complete disappearance of *Staph. aureus* was considered the safest insurance against relapse.

Results

All patients except one reported alleviation of symptoms and a number stated that their eyes had not been so comfortable for years. This was noticed in some cases within 24 hours, and by the end of a week 33 cases were feeling relief. The remainder lost their symptoms gradually.

Clinical recovery took place in 36 of the cases. Bacteriological recovery was registered in 24 of these, some accident preventing the final examination being made in the remaining 12. Though alleviation of symptoms occurred in 11 cases, treatment was not carried out regularly by 9 of them, nor was it continued by the two others till they could be pronounced as fully recovered. No improvement was reported in one case who had a refractive error and from whose lids no organism but *Staph. albus*, coagulase negative, was cultured.

Recovery following treatment

Clinical recovery		36 cases
(bacteriological recovery ...	24)	
(not done	12)	
Improvement		11 cases
(inadequate treatment, irregular	9)	
(not completed	2)	
No improvement		1 case
		48 cases

In spite of the rapid alleviation of symptoms, the disappearance of clinical signs and pathogenic bacteria took appreciably longer, but in all cases fully examined the former preceded the latter. Though mild cases, even when chronic, had recovered with a fortnight's treatment, the usual time that had to be allowed was 3-6 weeks. Some intractable infections recurred after one or two weeks' cessation of treatment, even when this had been continued till after *Staph. aureus* had disappeared from swab cultures. This gap lengthened the time of recovery in some cases, as did also lack of care and regularity in treatment. Evacuee children needed definitely more prolonged courses than did those who had their own parents to care for them.

TABLE II.—*Recovery Time*

	Total	1-2 weeks	3-6 weeks	7-10 weeks	12-14 weeks
No. of cases	36	7	15	11	3

Follow up.—All cases were asked to report a year after treatment had been completed. No conclusions can be drawn as to the value of penicillin in permanently eradicating the infection except from those in which treatment was completed and recovery registered (those in the " improved " category, eight of whom replied to the enquiries, are simply tabled as a matter of interest and comparison). This narrows the field down to 24 cases, as 12 of the 36 who showed clinical recovery did not reply to the enquiry.

The results might be classified under three headings, depending on whether the patient had (1) remained clinically and bacteriologically free of infection, (2) clinically free but having *Staph. aureus* again on his lids, (3) had suffered a relapse or re-infection.

TABLE III.—*Clinical follow up after 1 year*
(figures = No. of cases)

Condition at end of treatment	Condition 1 year later			
	Total reporting	No return of complaint	Reinfection	
			Relapse	Probably fresh infection
Recovery*	24	16	2	6
Improved but not adequately treated ...	8	3	5	—

* *Staph aureus* known to have disappeared in 16 cases.

Out of 24 cases, therefore, in which recovery had followed treatment, there had been a recurrence in eight, *i.e.*, a proportion of 1 : 3. If the association with measles, colds and sore noses, boils and styes, is accounted as a fresh infection rather than a relapse, the recurrence rate drops to 2 in 24, that is 1 : 12.

The bacteriological follow up was not quite so satisfactory. Table IV would appear to indicate that final bacteriological evidence that the infection has been eliminated is a better insurance against relapse than is reliance on clinical examination alone.

TABLE IV.—*Bacteriological follow up after 1 year*
(figures = No. of cases).

Condition at end of treatment	Condition 1 year later	
	Total examined	*Staph. aureus* present
Clinical recovery ...	7	4
Bacteriological and clinical recovery	12	4
Total	19	8

It is perhaps worth noting that a survey of these patients' records some two and a half years after this series was treated reveals the fact that no more than 7 of the original 48 have returned for treatment of a recurrence. As there is no other eye hospital in the district, this should represent a high proportion of cases which have been permanently relieved.

It is felt, therefore, that penicillin ointment offers a hopeful form of treatment for marginal blepharitis. The fact that two-thirds of the cases reporting showed complete clinical cure a year later in spite of the fact that concomitant conditions, such as seborrhoea capitis, tonsils and adenoids and boils were not especially dealt with, is the basis of this conclusion. Most probably better results still could have been obtained had all possible foci of reinfection been eradicated. This was purposely not done, so that the issue might not be confused by several methods of treatment.

Summary

48 cases of blepharitis have been treated with local application of penicillin ointment, 600-800 units per gram.

Staphylococcus aureus was isolated from the lesions of 39 of 41 cases examined bacteriologically.

36 of the cases applied their treatment regularly three or four times a day for as long as it was considered necessary (*i.e.*, 3-10 weeks).

Recovery took place in all these without removal of other foci of infection or any adjuvant treatment—other than epilation of a few lashes.

Bacteriological findings were found to be closely associated with clinical signs, but the disappearance of *Staph. aureus* from lid cultures was considered a better indication than clinical signs for cessation of treatment as it invariably succeeded the latter.

A follow up a year after treatment was discontinued revealed that two-thirds of the cases reporting had remained free of recurrences without any further treatment.

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BACTERIOLOGICAL AND CLINICAL OBSERVATIONS ON THE TREATMENT OF THE ACUTE OPHTHALMIAS OF EGYPT WITH SULPHONAMIDES AND PENICILLIN*

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DURING the past decade, chemotherapy with the sulphonamide drugs has been extensively used in ophthalmology and, inasmuch as the acute ophthalmias of Egypt are caused by bacteria which are sulphonamide-sensitive, their use in the treatment of these diseases was particularly indicated.

A considerable amount of experimental work on this subject has already been carried out at the Memorial Ophthalmic Laboratory since 1937 and papers have been communicated to the Ophthalmological Society of Egypt by Nashed,[1] Hilmi Hamid[2] and Wilson.[3]

These communications show that so far as sulphanilamide and sulphapyridin are concerned, sulphapyridin is much more effective in the treatment of the acute ophthalmias than sulphanilamide; especially does this apply in the case of acute conjunctivitis due to the Koch-Weeks bacillus upon which sulphanilamide has little or no effect. Sulphapyridin has proved therefore to be a most important and valuable weapon in our therapeutic armamentarium, for without question its effect in some cases of gonococcal ophthalmia is little short of miraculous. Furthermore, as a therapeutic agent for *both* forms of acute ophthalmia, it greatly surpasses any hitherto at our disposal. It can be used entirely unaided by silver nitrate or any other such antiseptic, and indeed it is doubtful if such antiseptics assist its action. Sulphapyridin, therefore, held pride of place for some years although it is not without toxic effects and is inclined to create a certain amount of general malaise and digestive disturbance. However, these are never serious as it is seldom necessary to prolong treatment for more than three or four days.

Among the newer sulphonamides, sulphathiazole and sulphadiazine have been found to be quite as efficacious as sulphapyridin, and possibly more so, without being as toxic, so it is natural that

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they have tended rather to supplant their more toxic predecessor. Of these two, sulphadiazine is even less toxic than sulphathiazole so that, provided it gives the same excellent results as sulphathiazole, it is likely to be the drug of choice. Experiments were, therefore, devised to test this out so far as their action in the acute ophthalmias is concerned.

It is usually stated that, in order that the above-mentioned sulphonamide compounds should be effective in the diseases for which they are administered, a standard concentration in the blood of 5 to 10 mgm. per hundred cubic centimetres should be maintained, and that, in order to ensure this, 0·5 gram for adults every 2 hours is advised. Emphasis is placed upon the necessity of maintaining an adequate concentration of the drug in the blood. In the following experiments, however, this has not been considered. The criterion has been the bacteriological state of the conjunctiva—in other words we have concentrated our attention on the bacteriological effects of the drug rather than on any particular blood levels. This mode of approach to the subject has not been commonly studied, for indeed in many diseases it is impossible to use it, but in infective diseases of the conjunctiva we are in the fortunate position of being able to follow exactly from hour to hour how the drug employed is affecting the conjunctival flora. This is what has actually been done and we have found, to our surprise, that the bacteriostatic effect of both the sulphonamides and of penicillin persists for long past the time when these drugs are ordinarily considered to have fallen below their effective level in the blood. We now propose to outline the results of these experiments. These were designed to elucidate 3 principal points:—

1. The effect of various sulphonamides upon the pathogenic flora in the acute ophthalmias, *i.e.*, the Koch-Weeks bacillus and the gonococcus.
2. The simplest and most satisfactory method of curing these conditions and the most effective sulphonamide for the purpose.
3. The relative values of sulphonamides and penicillin in the treatment of these diseases.

Technique

Before presenting the results of these experiments, it is important to make a few explanatory remarks regarding the procedure followed. In the first place, the work was carried out on ordinary hospital patients. Cases of acute purulent or muco-purulent conjunctivitis are not ordinarily admitted to hospital but, for the purposes of these experiments, it was imperative that all cases should be hospitalized, otherwise much exacting labour would have been wasted and carefully timed observations could never have been carried out. The method of calculation of dosage

remained the same throughout the entire set of experiments, and for all children and adolescents was based on a dose of 0·5 gram per 10 kilograms of bodyweight in the 24 hours. As a result of information gained from previous experiments, and in order to reduce treatment to its utmost simplicity and practicability, only two doses were given in the 24 hours. Each dose therefore was a half of the calculated 24 hourly dose. Lest it might be thought that this single dose is dangerously large, it may be noted that it is practically the same as the usual 6-hourly dose designed to give a concentration of 5-10 mgm. per 100 c.c. of blood. In other words, the total 24-hourly dosage which we employed is actually only a half of that usually recommended.

The calculation of dosage according to bodyweight is, however, not always convenient or practical, so that in actual practice we would suggest one based on age, the following figures serving as a guide :—

0-3 months	¼ tablet (½ gram tablet)	twice daily
3-6 ,,	⅓ ,,	,, ,,
6-12 ,,	2/5 ,,	,, ,,
1 year	½ ,,	,, ,,
3 years	¾ ,,	,, ,,
6 ,,	1 ,,	,, ,,
10 ,,	1·5 ,,	,, ,,
20 ,,	2·5 ,,	,, ,,

(Tobgy[10] bases his dosage on 0·5 gram per 20 kilos of bodyweight and states that he has perfect results.)

In Egypt, the great majority of cases occur in children under 10 years of age so that it is seldom necessary to give large amounts at any one time. In adolescents, the 24-hourly dose may preferably be divided into three. In infants, the administration of the drug frequently presents difficulty as part of the dose may be lost through spluttering. One cannot place fragments of a tablet in the mouth of an infant, nor is it satisfactory to put the dry powder into the mouth because this often causes irritation of the pharynx and coughing. It was ultimately found, after trying different methods, that the best way to give the drug was to suspend the dose in 2-3 c.cs. of milk and drop it into the child's mouth with an eye dropper. An alternative way is to make the dose up into a paste with milk or water and to insert it into the child's mouth on the end of one's finger.

In order to follow the bacteriological progress of the case, smears from the conjunctival discharge were examined before treatment was commenced, and thereafter at regular intervals as the experiment proceeded. At first, both cultures and smears were made but it was soon found that all essential information

could be got from the smear alone. An estimate by visual means was made of the relative number of organisms in the smear and the result recorded by a system of + signs. The following points were found important in technique if a just evaluation of numbers is to be attained.

1. Films must not be too thick or too thin, and must be spread evenly so that pus cells cover the field without clumps.

2. Immediately after taking the films, the everted lids and lid margins are swabbed to remove excess secretion so that the next film shall be made from freshly formed pus.

3. Films are stained by Gram's methods. A good technique is essential.

4. Films are searched for 5 minutes before being pronounced negative. A longer period would have resulted in more positives, but we were interested in relative rather than absolute results.

5. All films were estimated by one observer, so as to keep subjective factors constant.

The system of notation used in recording results in this paper is as follows:

\+ signs indicate gonococci, × signs Koch-Weeks bacilli.

\. \. = a negative film.

\+ = Not more than 3 fields containing organisms were found in a 5-minute search.

\+ + = Organisms in more than 3 fields but at wide intervals.

\+ + + = Organisms not found in every field but found in every few fields.

\+ + + + = One or a few organisms in every field.

\+ + + + + = Numerous organisms in every field.

\+ + + + + + = Every field crowded with organisms.

We are fully aware that this must seem a very rough and ready way of estimating the degree of bacterial multiplication in the conjunctiva and are alive to its inaccuracies, but the uniformity of our results show that the technique was, in fact, adequate for the purpose. The different grades in our scheme of enumeration are sufficiently well marked to be easy to differentiate when examining a film and have some real meaning even though this may seem rather imprecise.

A similar system was used for recording the main clinical signs: swelling and discharge. Thus, the degree of infection and the severity of the clinical state could be recorded at the outset and followed graphically throughout the experiment.

Results

1. *Description of Experiments and Bacteriological Effects.*

EXPERIMENT NO. 1—*A single dose of sulphapyridin.* (Table I).—A group of 7 children showing heavy infections, of which one was pure gonococcus, one a pure Koch-Weeks and 5 were mixed when seen in the morning. They were given a dose of sulphapyridin by mouth at 11 p.m. by which time the bacterial state of their conjunctivae was little changed. Hourly observations were begun 8 hours later.

This experiment showed that, except for the pure K.W. infection which proved extremely resistant, reduction of the numbers of bacteria must have begun during the 8 hour period when no observations were taken and was complete between 8 and 12 hours after administration of the drug. All but the pure K.W. case remained negative up to at least 21 hours after administration of the drug, three were still negative after 3 days and were considered cured. Two originally mixed cases showed a relapse on the 2nd day, one showing a heavy K.W. infection and the other a doubtful gonococcal infection which disappeared the next day. This case also can be considered a cure. One further case relapsed with gonococcal infection on the 3rd day. The resistant K.W. infection required three further doses of the drug, two on the 1st day following the original dose and one on the 2nd before it was cleared of bacilli.

This experiment shows the remarkable value and possibilities of this drug, a single dose of which cured nearly 60 per cent. of the cases. Such a result was quite unexpected. We had not expected a single dose to cure any case.

EXPERIMENT NO. 2—*The effect of 2 doses of sulphapyridin on 1 day.* (Table II).—The previous experiment suggested that a single dose probably begins to be effective about 5 hours after administration and remains so for at least 24 hours. If a second dose is to be given, it should be timed to become effective within this period, and therefore should not be given later than 19 hours after the first. In practice, this would be an awkwardly long interval, and in the following experiment we chose one of 9 hours. A group of 9 children showing heavy infections, 1 pure gonococcal, 3 pure Koch-Weeks, 5 mixed, were given a dose of sulphapyridin and a second 9 hours later. Conjunctival smears examined hourly to the 12th hour showed that the drug begins to be effective, as supposed, about the 5th hour and that clearing is complete, or almost so, by the 12th. All the cases were negative 21 hours after the 1st dose and 5 were completely cured including 1 pure gonococcus and 1 pure K.W. infection. The remaining 4 cases showed relapses on the 3rd or 4th day of the experiment and required further treatment.

TABLE I.—*Sulphapyridine 1 dose.*

Hours after treatment	34932 L. E.	34934 L. E.	34934 R. E.	34941 L. E.	34941 R. E.	34952 L. E.	34952 R. E.	34983 L. E.	34983 R. E.	35010 L. E.	35010 R. E.	35014 L. E.	35014 R. E.
Before treat. A.M.	+++	++++	+++++ xxx	++++ x	++++ xx	++++++	xx	++++ xxxx	+++++ xxx	+++++ xxxx	+++++ xx	xxxxx	xxx
Before treat. P.M.	++S	++ S xx	+++	++++ xx	S ++++ xxx	+++++ S	+++++	++++ S xx	++++ xxx	++++ S xx	+++++ x	xxxx S	xxxx
7 hrs. interval													
8	.	+ x	.	.	++ xx	++++	+++	++++ x	++	+ x	+	xxxxx	xxxx
9	.	x	.	.	+	+++	++++	+++	++	.	++	xxxxx	xxx
10	.	.	.	.	.	+	+	++	+	+	+	xxxx	xx
11	.	.	.	.	.	.	+	++	++	.	.	xxxxx	x
12	.	.	.	.	.	.	.	+	.	.	.	xxxx	x
13	.	.	.	.	.	.	.	.	.	.	.	xxxx	xxx
14	.	.	.	.	.	.	.	.	.	.	.	xxxx	xx
15	.	x .	.	.	.	.	.	.	.	.	.	xxxx	.
16	.	.	.	.	.	.	.	.	.	.	.	xxxx	x
17	.	.	.	.	.	.	.	.	.	.	.	xxxx	xx
18	.	.	.	.	.	.	.	.	.	.	.	xxxx	Sxxx
19	.	.	.	.	.	.	.	.	.	.	.	xxxxx	x
20	.	.	.	.	.	.	.	.	.	.	.	xxxx	.
21	.	.	.	.	.	.	.	.	.	.	.	xxxx	.
11 hrs. interval													
33	.	.	.	xx	xx	.	.	.	.	.	.	xxx	.
34	—	—	—	—	—	—	—	—	—	—	—	xxxx	S .
35	—	—	—	xx	xxxx	—	—	—	—	—	—	xxx	.
36	—	—	—	xxx	xxxxx	—	—	—	—	—	—	xx	.
37	.	.	.	xxxx S	xxxxx	.	.	.	.	.	.	xx	.
48	.	.	.	xx	xx	.	.	.	.	.	++	.	.

S = Sulphapyridine by mouth.

TABLE II.—*Sulphapyridine 2 doses in One Day.*

TABLE II.—*Sulphapyridine 2 doses in One Day.*

Hours after treatment	36081 L. E.	36081 R. E.	36084 L. E.	36084 R. E.	36137 L. E.	36137 R. E.	36117 R. E.	36211 L. E.	36086 L. E.	36086 R. E.	36104 L. E.	36104 R. E.	36169 L. E.	36169 R. E.	36093 L. E.	36093 R. E.
Before treatment	+++++	+++++	++++	++++	+++	+++	++++	+++++	++++	+++++	xxxx	xxxx	xxx	xxxxx	xxxxx	xxxxx
			xx			x	x	xx	xxx	xxxxx						
		S		S	S		S	S		S		S		S		S
2	+++++	+++++	+++	++++	+++	+++	+++++	++++	++++	+++	xxxx	xxxx	xxxx	xxxxx	xxxx	xxxxx
						x	xx		xx	xxx						
3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4	++++++	+++++	++++	+++++	++++	++++	++++	++++	++++	++++	xxx	xxxx	xxxx	xxxxx	xxxx	xxxxx
			xxx		x xxx	xxxx	x	xxx	xxx	xx						
5	++++++	+++++	++++	++++	+++	+++	++++	++++	+++	++++	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
			xxx		xxx	xxx		xxxx	xx	xxx						
6	+++++	+++++	+++	+++	++++	+++	++++-	++++	++	++++	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
			x xx		x xxx	xx		xxx		xxxx						
7	+++	++	++	+++	++++	++++	++++	++++	+	+++	xxx	xxx	xxxx	xxxxx	xxxx	xxxx
			xx		xx	xx			x	xx						
8	++++	++	+	++	+++	++	+++	++++	+	+	x	xx	xx	xxx	xxxx	xxx
			x		x			x								
9	++S	.		S++	++S+		S+	S+		.S .	. S	x	x S	xxx	xxxx	S xxxx
			x					x								
10... ...	.	+	.	.	+	+	.	++		.	x	.	x	.	xxxx	xx
								x								
11... ...	.	.	.	.	+	+	.	+		. .	x	x	.	x	x	.
12... ...	.	.	.	.	+	+	.	.		. .	.	.	.	xx	x	xxx
9 hrs. int. 22 to 38 ...	...	... ...	...	...	4 hourly observations—all negative				...	... ...	...	... ...	...	...	...	...
2 days ...		. .		. .		. .	.	.		. .	x	.	.	.	.	.
3 days ...		— —		— —		— —	—	—		— —	xxxxx S	xxxx	xxxx S	.	—	—
4 days ...		— —		. .		+++S++++ xxx xxxxx	—	.		x x x x x S x x x x	.	.	.	.	.	.
5 days ...		. .		— —		. .				. .	. S	.	. S	.	—	—
6 days ...		— —		— —		.S.	—	—		. S .	—	—	—	—	—	—
7 days ...		— —		— —		. .	—	—		— —	.	.	—	—	—	—

S=Sulphapyridine by mouth.

This experiment showed that 2 doses of sulphapyridin are insufficient to cure all cases and indeed are not noticeably more effective than a single dose. Consequently, we proceeded to examine the effects of sulphathiazole and sulphadiazine. In the experiments with these drugs, observations were made 4 hourly for the first two days instead of hourly, since these intervals would be sufficient to reveal any important difference between the rate of action of these drugs and that of sulphapyridin. No such difference was found to exist and therefore it will not be necessary to exhibit these experiments in the form of charts.

EXPERIMENT NO. 3—2 *doses of sulphathiazole on* 1 *day*.—Ten cases of heavy infection, 3 pure K.W. and 7 mixed, were given a dose of sulphathiazole and a second similar dose 8 hours later. Twelve hours after the first dose, all except one K.W. case were clear of bacteria or showed only a + infection. Twenty-four hours after the first dose all were clear. Seven, including 1 of the K.W. cases, remained so up to the 4th day and were discharged cured. Three cases, 2 K.W. and 1 mixed, showed recurrences of K.W. infection on the 3rd day and required further treatment. This result suggests that sulphathiazole may be a little more effective than sulphapyridin, but the number of cases in the two series is too small to warrant a firm conclusion. In any event, two doses of this drug are not sufficient to cure all cases of K.W. infection.

EXPERIMENT NO. 4—4 *doses of sulphathiazole in* 2 *days*.—Sixteen cases of heavy or moderately heavy infection, 7 pure gonococcal and 9 mixed, were given 4 doses of sulphathiazole; at 12 noon and 10 p.m. on the first day and at 10 a.m. and 7 p.m. on the second day. Observations were made daily for 5 days. All the cases were clear of bacteria after 24 hours and remained so throughout. This scheme of treatment therefore resulted in 100 per cent. cures.

EXPERIMENT NO. 5—2 *doses of sulphadiazine on* 1 *day*.—Twelve cases of heavy infection, 7 pure gonococcal, 1 pure K.W., 4 mixed, were given 2 doses of sulphadiazine at 8 hours interval and observations were made up to the 5th day. All were clear, or almost clear, of bacteria by the 12th hour. All, except the pure K.W. case and one mixed case, were completely cured, though two of them could only be followed up to the 3rd day. Both the relapses were of K.W. bacilli only. This result shows an improvement on the results of similar treatment with sulphapyridin or sulphathiazole, but again the number of cases is too small for firm conclusions and in any case the method does not cure all cases.

EXPERIMENT NO. 6—4 *doses of sulphadiazine in* 2 *days*.—Ten cases, 1 pure gonococcal and 9 pure K.W. infections, were given 2 doses of sulphadiazine on each of two successive days and were followed with daily observations for 5 days. All were clear of bacteria 24 hours after beginning treatment and all were cured.

A summary of the results of these 6 experiments is given in tabular form in Table III.

TABLE III.—*Results of Six Experiments with Sulphonamides.*

	SULPHAPYRIDINE							
	One Dose				2 Doses in 1 day			
	G. C.	K. W.	Mixed	Total	G. C.	K. W.	Mixed	Total
No. of cases	1	1	5	7	1	3	5	9
No. of complete cures	1	—	3	4	1	1	3	5
Relapses	—	—	1 K. W. 1 G. C.	3	—	2	1 K. W. 1 G. C. 1 K. W.	4

	SULPHATHIAZOLE							
	2 Doses in 1 day				4 Doses in 2 days			
	G. C.	K. W.	Mixed	Total	G. C.	K. W.	Mixed	Total
No. of cases	—	3	7	10	7	—	9	16
No. of complete cures	—	1	6	7	7	—	9	16
Relapses	—	2	1 K. W.	3	—	—	—	—

	SULPHADIAZINE							
	2 Doses in 1 day				4 Doses in 2 days			
	G. C.	K. W.	Mixed	Total	G. C.	K. W.	Mixed	Total
No. of cases	7	1	4	12	1	9	—	10
No. of complete cures	7	—	3	10	1	9	—	10
Relapses	—	1	? 1 K. W.	2	—	—	—	—

The number of cases used in any one of our experiments is not large and might indeed be thought too small to justify conclusions, but certain features of the results in all the experiments have proved constant and reveal that there is a close similarity between the action of all these drugs. Thus, Experiment No. 1 and Experiment No. 2 taken together suggest that a single dose of sulphapyridin produces no effect on the conjunctival flora up to 4 hours after administration, that soon after the 4th hour the action of the drug begins and that this is pronounced after 8 hours. Experiments 3 and 4 with 2 doses of sulphathiazole and sulphadiazine showed the same phenomena. Experiment No. 1 also suggests that a single dose will produce complete clearing of the conjunctiva in most cases at, or shortly after, the 12th hour. Experiment No. 2 shows that administration of a second dose 9 hours later does not influence the speed of this final result; while Experiments 3 and 4 are so similar to Experiment 2 that we can assume the same is true for sulphathiazole and sulphadiazine. Sixty-four cases, therefore, the total of all our experiments, make it clear that a single dose of any one of these sulphonamides will be followed by a lag period of about 4 hours before bacteriostasis begins and will cause complete disappearance of both gonococci and K.W. bacilli in about 12 hours. Only very occasional cases will be found resistant to this action. We encountered only one, the K.W. case in Experiment 1, in our series of 64. Experiment 1 further shows that a single dose of sulphapyridin will result in the complete cure of a large number of cases, and this is probably also true for the other two drugs.

Turning now to Experiments 2, 3, 4, 5 and 6, designed to find the simplest completely effective treatment, we find that if we consider the mixed cases as individual infections with the gonococcus or the K.W. bacillus, then 2 doses were sufficient to cure 22 out of 23 cases of gonococcal infection. The one case that relapsed was a mixed infection treated with sulphapyridin. But the K.W. bacillus is more resistant. None of the three compounds completely eradicates it from all cases with 2 doses; with sulphapyridin 4 out of 8 cases relapsed, with sulphathiazole 3 out of 10 and with sulphadiazine 2 out of 5. Yet it must be emphasized that in every case the conjunctival discharge was bacteriologically negative for at least the whole of the day following the 2 doses, including the cases that relapsed, and that with sulphapyridin the relapses occurred on the 2nd, 3rd and 4th days, with sulphathiazole on the 2nd and 3rd, with sulphadiazine on the 4th and 6th. The latter case indeed should probably be counted a fresh infection. Thus it is clear that 2 doses only of any of these compounds might be sufficient to cure practically all gonococcal infections but that further treatment is necessary to ensure that relapses will not occur amongst K.W. cases. Experiment 5 and

6 show that when 2 further doses of sulphathiazole or sulphadiazine are given on the following day all cases are cured, the numbers concerned being 26, 16 with sulphathiazole, 10 with sulphadiazine. Further, although 18 patients had K.W. infection, not one of these relapsed. Either compound may therefore be used with confidence, but the preference must be given to sulphadiazine which is less toxic than sulphathiazole and more rapidly acting. It is for this reason that we made no four-dose experiments with sulphapyridin for this drug is the most toxic, and judging from our experiments, the least effective of the three.

Clinical effects

At this stage in the history of sulphonamide treatment, it is unnecessary to discuss in detail the purely clinical effects of these drugs. Everyone now knows how remarkably effective they are in the treatment of ophthalmia. In the clinical signs, however, there is always a time lag behind the bacteriological findings, for although the smears may be negative in 9 hours it takes from 24 hours to 3 days to complete the clinical cure. This delay has undoubtedly influenced us in the past to carry on treatment for 3-4 days—in fact to over-treat our cases. Experiments 5 and 6 make it clear that this is unnecessary. Only if a case shows a bacteriological relapse should further treatment be given. Symptoms are apt to persist longest when the case is complicated by corneal ulceration, but in these cases the discharge no longer contains the original causal organism but only secondary invaders, such as staphylococci or diphtheroids.

Morphological effects on the causal organisms

We have made no detailed study of this subject but have, nevertheless, made a few observations in the course of the work which may be of interest to others. In the gonococcus, the effects are uninteresting. About the time when the drug begins to become effective, one starts to find large swollen coccoid elements in the smears which are similar to the involution forms found in old cultures of gonococci. These are thereafter regularly seen until the case becomes negative. They are presumably dead cocci.

In the case of K.W. bacilli, the effects are more interesting. Again, about the time the drug begins its action one notices that the bacilli tend to be longer than normal, and when the drug becomes fully effective, *i.e.*, when the smear reaches the ++ or + stage, this elongation is often pronounced. Single bacilli and small clumps are found which stretch across the whole diameter of the leucocyte that has engulfed them and sometimes quite long curled filaments are seen. This elongation is not accompanied by any swelling or fattening of the bacilli. This metamorphosis

may perhaps be related to a similar occurrence we have often noted in culture. When the K.W. bacillus is sown on blood agar, it is usual for it to grow in the form of long bacilli and very long twisted, curled and tangled skeins of filaments. If such a culture is now subcultured on to heated blood agar, in many cases the organism reverts to the regular rod-shaped form of medium length which is its habitual appearance in the ocular discharge. It may be that the elongation of the bacilli in both cases is a result of life in unfavourable circumstances and is related to a disturbance of nutrition, caused in the case of sulphonamides by an interference with metabolism and in culture by an insufficiency in the blood agar of some metabolite supplied by the heated medium. Such a suggestion is, of course, entirely speculative.

Relative values of penicillin and sulphonamides

The number of cases treated with penicillin was small, and the few experiments were early abandoned because it rapidly became apparent that penicillin is quite unsuitable for the treatment of the acute ophthalmias whether administered intramuscularly or employed in the form of drops. The following is a brief summary of the results obtained by intramuscular injections, and Tables IV and V are typical illustrative charts.

EXPERIMENT NO. 1.—***Penicillin 4 hourly for 1 day*** (360 units per kilo of bodyweight per dose). 3 cases G.C. ophthalmia—2 cases recurred.

EXPERIMENT NO. 2.—***Penicillin 3 hourly for the first 24 hours*** (275 units per kilo per dose).

4 hourly for the second 24 hours (360 units per kilo per dose).

One case G.C. ophthalmia—G.C. cured—no recurrence, but became infected with K.W. which was unaffected by penicillin.

One case K.W. ophthalmia—no effect.

Both K.W. infections yielded satisfactorily to sulphapyridin.

EXPERIMENT NO. 3.—***Penicillin—2 injections at 24 hourly intervals*** (360 units per kilo of bodyweight per dose).

7 cases { 3 G.C. / 4 mixed K.W. and G.C. } No cure of either type.

EXPERIMENT NO. 4.—***Penicillin at 12 hourly intervals for 2 days*** (730 units per kilo per dose).

5 cases { 4 G.C. / 1 mixed K.W. and G.C. } G.C. in all cases cured—no recurrences. Two G.C. cases developed K.W. No effect on any of the K.W. infections.

The results obtained when employing topical application were even less encouraging. Every precaution was taken to ensure

that only highly active solutions of calcium penicillin were used but only one concentration was employed, viz., 500 Oxford units per c.c. Drops were instilled at approximately hourly intervals during the day only, it being impossible to arrange for treatment during the night. In addition the eyes were washed out with saline each morning (and if necessary at other times of the day when discharge was copious). The following results were obtained :—

(1) *Gonococcal Ophthalmia.*—Eleven cases in all were treated, of which 8 were cured in an average of 6 days. In 3 cases the response was so unsatisfactory that, fearing complications, sulphonamides were resorted to on the 2nd, 3rd and 8th days respectively. In 2 cases, K.W. bacilli appeared in the discharge during treatment and for these also sulphonamides had to be employed to complete the cure.

(2) *Koch-Weeks Ophthalmia.*—Of 8 cases treated, only one was completely cured and that only after 8 days. Two cases were unaffected by treatment and actually became worse, so that sulphonamides had to be resorted to. In 5 cases, there was an apparent cure, but the conjunctival sac in each case still contained K.W. bacilli at the end of treatment. Two of these cases relapsed several days later.

Actually, it is doubtful if the penicillin had any therapeutic value in any of these cases, for the improvement was probably due to the saline washouts and to natural healing processes. The average time taken from onset of disease to final " clinical " cure was 10 days.

Conditions and known facts did not encourage us to test out the effect of stronger concentrations of penicillin, for Garrod[4] has shown that nothing is likely to be gained by using high concentrations particularly for local treatment.

The results of our experiments permit the following conclusions ;

Penicillin given intramuscularly is highly potent in gonococcal ophthalmia (Table IV). A single injection brings about a complete disappearance of gonococci from the conjunctival discharge within 2-3 hours and will maintain the eye free of gonococci for about 10 hours, a rather surprisingly long period, but repeated injections over at least 2 days are necessary to obtain a complete cure and, moreover, further experiments by Sabri Kamel[5] have shown that relapses may occur if 12 hourly injections are employed (cf. Experiment 4). Topical applications are extremely laborious and would impose an enormous strain on the nursing staff if (as ought to be done) drops are employed both day and night. The results in no way justify such a method of treatment seeing it has been proved that the sulphonamides are so eminently effective and satisfactory. Furthermore, penicillin utterly fails to

TABLE IV.—*Penicillin. Effects of widely spaced Doses.*

Hours after Injection	34201 L. E.	34201 R. E.	34202 L. E.	34202 R. E.	34218 L. E.	34218 R. E.	34234 L. E.	34234 R. E.	34162 L. E.	34162 R. E.
Before injection...	+++	++++	++++	++++	+++++	++++	+++++	+++++	.	++++
							xxx	xxx		
	P		P		P		P		P	
1	++++	++++	++++	++	++++	+++	+++++	+++++	+	++++
			x				xxx	xxx		
2	+	+	+++	+	++	+	++	++	.	++
							xx	xx		
3	.	.	+	.	.	+	+		.	+
							xx	xx		
4	.	.	.	x	.	.	xxx	xxxx	+	.
5	.	.	.	.	.	.	xxx	xxx	.	.
6	.	.	.	.	.	.	x	.	.	.
7	.	.	.	x	.	.	xx	x	.	.
8	.	.	.	.	+	.	xxxx	xx	.	+
9	.	.	xx	x	.	.	xxxx	xxxxx	.	.
10	.	.	.	x	.	.	xxxx	xxxx	.	.
11	.	+	.	x	.	.	xxxx	x	.	+
12	+ P	+	.	x	+ P	.	+ P	+	. P	+
							xx	x		
12 hours interval										
24	. P	.	P		. P	.	P		. P	.
			xxxx	xxxx			xxxxx	xxxxx		
33	. P	.	P		P	.	P		+ P	.
			xxxx	xxx	xxxx	xxx	xxxx	xxxxx		
2 days	.	.	xx	xx	x	.	xxxxx	xxxxx	.	.
3 days	xx	xxxx	xxx	xx	xxxx	xxxx	xxxx	xxxx	.	.

P = Penicillin by intramuscular injection.

reduce in any way the number of bacilli in K.W. cases even when given 3-hourly by injection, indeed the bacilli actually appear to increase in numbers despite the fact that such cases may show some slight clinical improvement (Table V), a result we fully expected considering the close relationship, if not identity, of the K.W. bacillus and *H. influenzae* which is not sensitive to penicillin. Penicillin is therefore of no value whatsoever in K.W. conjunctivitis whether by injection or locally, so that in at least 50 per cent. of the cases of ophthalmia in Egypt it is not only useless but is contraindicated as it is very likely to leave the case

TABLE V.—*Penicillin. A Koch-Weeks case treated with 3 hourly injections.* (Case No. 31157).

Hours after injection	L. E.		R. E.	Hours after injection	L. E.		R. E.
Before injection...	xxxx		xxxx	15...	xxx	P	xx
		P		18...	xx	P	xx
1	xxxx		xxx	21...	xxx	P	xx
2	xxxx		xxx	24...	xxx	P	xxxx
3	xxx	P	xxx	28...	xxxx	P	xxx
4	xxx		xxx	32...	xxxx	P	xxx
5	xxxx		xxx	36...	xxxx	P	xxx
6		P		40...	xx	P	xx
7	—		—	44...	xxxx	P	xxxx
8	xxxx		xxxx	48...	xxxx		xxxx
9	xxxx	P	xxx	3 days	xxxxx	S	xxxxx
10	—		—	4 days	xxxxxx	S	xxxxx
11	—		—	5 days			
12	xx	P	xxx	7 days			

P=Penicillin by intramuscular injections.
S=Sulphapyridin 2 doses daily.

a carrier. Even in pure gonococcal ophthalmia, penicillin parenterally has no real advantage over sulphathiazole or sulphadiazine, for although the sulphonamides take 6-9 hours longer to render the conjunctival discharge bacteriologically negative, this initial delay is of little consequence. It is unlikely that by the slightly more rapid action of penicillin any serious complications, such as perforation and prolapse of iris, would be averted. In the purely gonococcal case, the speediest cure would be most surely obtained by repeated injections of penicillin, but this demands treatment which can only be given in hospital and even then is difficult to apply in Government Ophthalmic Hospitals in Egypt (where cases occur by the hundreds of thousands), and also demands that the diagnosis should be carefully established by smear examination beforehand as it is useless to persist with penicillin either in pure K.W. cases or in mixed cases.

On the other hand, the treatment with sulphonamides which

we have suggested could not possibly be more simple or more easily carried out, does not require hospitalization and is alike successful in both gonococcal and Koch-Weeks ophthalmia.

Discussion

Those who know the conditions of Egyptian life[6] or have studied the work of Wilson[6-9] will realise the import of our experiments. Each year, an epidemic of acute ophthalmia afflicts that country[7, 9] striking particularly at the infants and small children, of whom not one except among a negligible minority of the very rich escapes an attack before its second year of life.[7, 8] This scourge is the cause of 80 per cent. of the blindness (total blindness 1 per cent., monocular 4 per cent.) of Egypt and leaves behind, in addition, a multitude of more or less serious ocular defects.[6] The increased ocular secretion caused by the disease promotes also the spread of trachoma,[8] that second universal plague of Egypt, itself a fertile source of damaged sight. No treatment which requires hospitalization or even attendance at hospital, no treatment which cannot be taken to the villages, where the great majority of the people live, and there simply and easily administered, can hope to do more than scratch the surface of this problem. The treatment with sulphonamides which we have described is exactly such. It is simple, safe, effective and could be given by unqualified persons with a minimum of training; it provides, we believe, the necessary solution, not only for Egypt but for other oriental countries where similar conditions of life and disease prevail. Made available in the villages, it would soon be used by the people and would result in a great diminution of the evil effects of ophthalmia. Yet, more important than its value to the afflicted sufferers, it offers the hope of checking and even, perhaps, of eradicating the yearly epidemic. The untreated case of acute ophthalmia discharges living and virulent organisms from its eyes for at least 6 days, during the whole of which period it is a source of infection for its neighbours. By sulphonamide treatment, this period can be reduced to perhaps 1 or 2 days, for any case will be rendered non-infective 12 hours after the first administration of the drug. A reduction of the infective period to 1/6 of the usual will, if most cases are treated, undoubtedly have an effect on the course of the epidemic. How great that effect will be, we cannot tell without a field experiment on a large scale, but it is not unreasonable to hope that it might be decisive. It is of the utmost importance that such field experiments be done and the treatment made available in all countries where this disease occurs.

Summary and conclusions

1. The effect of various dosage with sulphapyridin, sulphathiazole, sulphadiazine and penicillin on the bacterial condition of

the conjunctiva was studied by means of repeated smear examinations in the acute epidemic ophthalmias (Koch-Weeks and gonococcal) of Egypt.

2. A single dose of sulphonamide will cause a reduction of bacteria in four hours and total suppression of bacteria in about 12 hours. A considerable proportion of gonococcal cases will be cured by a single dose but Koch-Weeks cases are more resistant.

3. Two doses at 8-hour intervals in one day of sulphathiazole or sulphadiazine will cure almost all gonococcal cases but not all Koch-Weeks cases.

4. Two doses on two successive days (4 doses in all) will cure all cases of gonococcal and Koch-Weeks ophthalmia with very rare exceptions.

5. A single intramuscular dose of penicillin will reduce gonococci to nil in 3-4 hours but repeated doses at short intervals are necessary to ensure cure. Relapses occur in 10-12 hours after a single dose.

6. Penicillin has no effect on Koch-Weeks cases and is therefore unsuitable as a treatment for acute Egyptian ophthalmia.

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BRANCH THROMBOSIS OF MIDDLE CEREBRAL ARTERY*

BY

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A WOMAN, aged 60 years, whilst shopping one day at the beginning of April, 1944, experienced a severe left-sided headache. She noticed that she could only see the left-hand side of the shopping list which she was holding in her hand. These symptoms occurred suddenly and concurrently. In an endeavour to

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overcome the headache she had a cup of coffee, but she became nauseated and vomited shortly afterwards. The headache persisted. By the evening her headache and nausea had largely disappeared. She developed a new symptom, finding herself using the wrong words when she tried to frame a sentence. She was perfectly aware of what she wanted to say and had no difficulty in sounding words, but the wrong words kept creeping into her speech. This disturbance of speech passed off within two days.

She attended the Eye Department of the Western Infirmary, Glasgow, eight days later, and was still aware of a defect in vision when looking to the right. Extreme difficulty in reading was present as she could only see the left-hand side of the page clearly, but there was obviously associated difficulty in the appreciation of the written word. She had at that time no other abnormal symptoms, her headache, nausea and disturbance of speech having completely disappeared, but there was a vague feeling of being less mentally alert than she had been prior to the onset of her illness. This showed itself by defective powers of concentration and physical weariness.

The patient gave no relevant history of past ill-health, but during the last five years at various times she has been conscious of a smoky smell, associated with a dulling of taste sensibility. She has been subject to headaches for a considerable time. Since March, 1941, when her house was destroyed by a bomb, she has had a very unsettling time. Her husband died in July, 1943, after fifteen months of serious illness. Her father and grandfather both died of cerebral haemorrhage.

Physical examination, including a detailed neurological examination, revealed no abnormality, apart from her eye condition. Blood pressure was 160/90 mm. Hg. Examination of the patient's eyes showed the following details. Pupils reacted as in health. Her corrected vision was, Snellen 6/24 and Jaeger 6, in each eye. With the ophthalmoscope both discs were normal but there were marked arterio-sclerotic changes in the vessels. No haemorrhage or exudates were observed. A few mistakes were made on reading Ishihara colour plates and later examination showed persistence of defective colour perception.

The fields of vision in both eyes were full when tested on the perimeter with 3/330 white test object, and this remained constant throughout the period of investigation. There was a right superior homonymous quandrantic scotoma adjacent to the fixation point in both eyes. In the right and left eyes the lower borders of the scotomata were sharply defined and lay along the horizontal meridian. In the left eye it extended from the vertical meridian and was clear cut in that area. The other borders of the scotomata could not be accurately localised because they changed

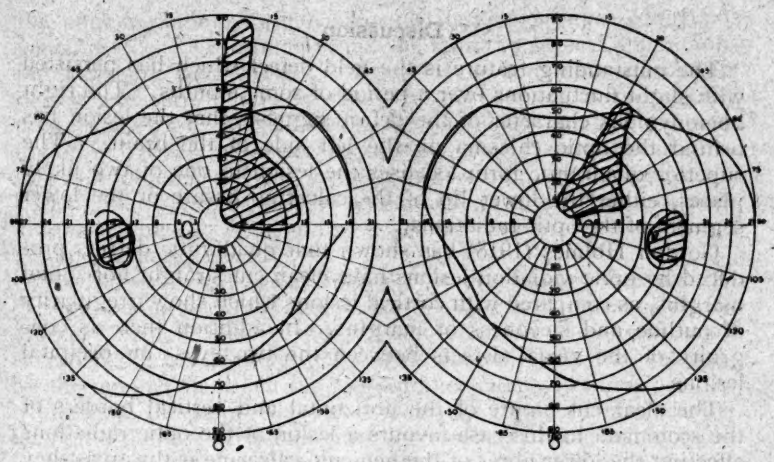

FIG. 1.

from absolute to relative defects on moving the target towards the periphery. On recent examinations, however, the peripheral borders have tended to become more sharply defined. The scotoma was always larger in the left eye than in the right and varied in extent on different occasions. This variation is represented in diagrammatic form as recorded on the Bjerrum screen with 3/1000 white test object. (Fig. 1.) Coloured targets did not yield any additional information. Her visual acuity was recorded at intervals and is shown in Table I. In each case the figures refer to the corrected vision.

TABLE I

Corrected Visual Acuity

1944	Right Eye	Left Eye
April ...	6/24	6/24
May ...	6/12	6/18
June ..	6/12	6/12
July ...	6/12	6/12
August ...	6/12	6/12
September	6/9	6/12
October...	6/9	6/12

Discussion

The outstanding feature is the field defect which has persisted with slight fluctuations over a period of some months. The right homonymous character of the defect suggests that the lesion lies behind the optic chiasma on the left side of the brain. The superior quadrantic form localises the lesion to one of two likely places, either the lower lip of the calcarine fissure or the lower segment of the optic radiations.

Gordon Holmes (1918) has shown that quadrantic defects produced by optic radiation lesions have clean cut straight horizontal margins, as compared with cortical lesions which show irregularity of outline and steepness of margins. In addition there is congruity of the visual defects between the two eyes in occipital lesions.

The clear cut nature of the horizontal and vertical borders of the scotomata in this case favours a lesion of the optic radiations affecting the lower fibres of the geniculo-calcarine pathway as they lie at the tip of the descending horn of the lateral ventricle in the temporal lobe. This view is supported by the occurrence of sensory aphasia during the first two days of the illness. A temporal lesion on the left side would be expected to produce this complaint in a right-handed person. The lower fibres in their detour downwards and forwards are related to the uncinate region of the temporal lobe which is concerned with olfactory sensations, and this may be related to the peculiar hallucinations of smell experienced by the patient at intervals in the past five years.

In addition to this transient aphasia the patient experienced great difficulty in reading in the earlier weeks of the illness. This could be explained on the grounds of the field defect, but latterly she has been able to read fairly well despite the fact that her scotomata are still as gross as ever. This apparent anomaly may be due to adaptation on the patient's part to a field defect; although there was evidence of recovery from an aphasia which produced originally failure of comprehension of printed propositions and associated early fatigue in reading.

The main weight of the lesion has fallen on the visual pathways giving rise to a constant scotoma; involvement of the cortex was a secondary effect, possibly due to oedema around the area of permanent brain damage. The subsidence of the oedema would account for the recovery from the aphasia.

The Bjerrum screen records show that at each examination the scotoma in the left eye is more extensive than that in the right. Interference must have taken place at a position in the visual pathway where fibres from corresponding retinal points were not yet lying together. Traquair (1922) states that a larger scotoma is found in the ipsilateral field in lesions affecting the lower fibres of

the optic radiations, whereas cortical lesions produce congruous visual defects. Confirmation may be found in several illustrations published by Behr (1930). Fields of homonymous quadrantic defects are shown, and in many instances there is incongruity between the right and left fields, the one defect being larger than the other. Behr, in discussing this asymmetry, says that in some cases the difference is due to faulty observation or tiredness of the patient, but all cases cannot be explained on this basis because differences have been found of a similar degree on repeated and modified examinations.

The present case comes into the latter category because the patient was an accurate observer who was tested repeatedly with different methods and yet the ipsilateral scotoma on every occasion exceeded the contralateral one. This anomaly may be explained by the manner in which the crossed and uncrossed fibres are distributed in the optic radiations. If the fibres running in the temporal lobe are predominantly uncrossed, then the lesion could be explained on this basis. It would follow that the more ventral lesions would tend to produce incongruities in the scotomata. An alternative explanation which has been put forward by Traquair is that the crossed fibres may occupy a situation relatively less exposed to interference by pathological processes in the temporal lobe.

Another feature of the field defect is the more accurate definition of the periphery of the scotomata in recent examinations. The ill-defined zone is tending to disappear. This is in agreement with Roënne (1915) who states that the peripheral border becomes sharper as time elapses in such cases.

The shape of the scotoma is conditioned by anatomical considerations. The fibres from the retina are divided vertically by the decussation at the chiasma. Consequently a lesion affecting one side of the brain can involve only the fibres from the paired upper and lower quadrants of the two eyes, upper and lower temporal in the one and upper and lower nasal in the other. These paired quadrants are themselves divided horizontally by the division of the optic radiations into upper and lower groups. Thus a unilateral lesion affecting one such group gives a field defect which is limited to one quadrant of the visual field. It therefore follows that fibres from any two points in the retina which lie in different quadrants even if these points be close together, are widely separated in the optic radiations because they run in different groups. On the other hand fibres from two points which lie in the same retinal quadrant, no matter how far apart they may be within the quadrant become associated in the optic radiations into one group.

In this case the pathological process has affected selected fibres of the ventral portion of the geniculo-calcarine pathway, causing

a permanent scotoma in each eye adjacent to the fixation point but not extending throughout the whole visual quadrant. In the early stages, however, associated oedema temporarily affected neighbouring fibres. It was this transient and variable implication of related fibres which caused the ill-defined peripheral border of each scotoma in the early stages, but it did not cause extension beyond the vertical or horizontal limits of the quadrant for reasons given above.

The sudden onset of the condition indicates a vascular disturbance. The general clinical condition and progress of the patient suggests a thrombosis of the parieto-temporal branch of the left middle cerebral artery which supplies the lower fibres of the left optic radiations.

Summary

A middle-aged woman suddenly experienced a left-sided headache associated with a defect of the right side of both visual fields. There was transient aphasia of the receptive type with disturbance of comprehension of written speech and with a slight jargon aphasia.

The visual agnosia, which is the only persistent feature, is a right superior homonymous quadrantic scotoma adjacent to the fixation point with sharply defined vertical and horizontal borders. The peripheral border, which was at first very vague, is now more decisive. There is incongruity between the scotomata, the left one being larger than the right.

The clinical findings are in agreement with a diagnosis of thrombosis of the parieto-temporal branch of the left middle cerebral artery.

I am indebted to Prof. W. J. B. Riddell for permitting me to record this case and for valued advice and criticism.

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THE USE OF INSULIN IN THE TREATMENT OF CORNEAL ULCERS*

BY

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THE treatment of ulcers of the cornea by the usual methods of chemical or thermal cauterization, plus the use of the sulphonamide preparations (and more recently penicillin) is as a rule satisfactory and adequate, but there are still occasional cases which are troublesome and I should like to report a few in which I have thought the use of insulin beneficial in promoting more rapid healing than appeared otherwise likely.

CASE 1.—In 1937 I was treating a man with right facial paralysis of old standing who had ectropion and associated chronic conjunctivitis. He had developed a large corneal ulcer and was admitted to hospital.

The ulcer was carbolized and various drops were used for nine days without improvement. It was then I suggested using insulin as drops, and two or three days later when I saw him, though the site of the ulcer looked white and "soggy," much to my surprise it did not stain with fluorescein. There seemed to have been an excessive proliferation of epithelium. He made an uninterrupted recovery.

The sequel to this case is that a year later he came under the care of another ophthalmic surgeon who asked me to see him after a fortnight of unavailing treatment. I recognised the man, who was then given insulin drops to use as an out-patient. The ulcer was quite healed when I saw him the following week. I have seen him again this year and there has been no recurrence.

Since that time I have used insulin both as drops and by injection in any case which did not respond to the usual methods of treatment. Latterly I have confined the insulin treatment to the injection of five units daily, which, if used on out-patient cases, is accompanied by the oral exhibition of glucose.

CASE 2.—A Service case with burns of face and severe general injuries.

The left eye was blind and the right eye showed a large exposure ulcer occupying the lower third of the cornea up to the margin of the pupil. Complete apposition of the lids was impossible owing to burns and sepsis.

Treatment with albucid drops, and later mercurochrome, and saline irrigations was carried out for two or three weeks without improvement. The patient was then put on injections of insulin

* Received for publication, February 10, 1945.

and showed no change for four days. I examined him while he was having a general anaesthetic one morning and his ulcer seemed exactly the same size, and stained throughout with fluorescein. Two days later it had completely healed except for a hair-line of staining round the periphery.

CASE 3.—A child, aged two, with severe Pink Disease.

Most of the child's hair had come out, the chest was full of râles, and both first and second teeth were being shed, the latter due to necrosis of the jaw. The right eye showed a superficial ulcer covering about five-eighths of the cornea.

Three units of insulin were given daily and four days later the ulcer was healed. In view of the very poor general condition of the child, I was inclined to think that the eye might be lost. No carbolization was done.

CASE 4.—I here include notes of a case which Mr. Basil Graves had under his care, which he has kindly made available.

" A patient had had chronic superficial ulceration of the right cornea in 1915 and in 1925. An excavating ulcer occurred in 1944, not far from the centre of the cornea. There was very little ciliary injection.

" The eye persisted in this state for months, and in spite of the trial of various customary local and general treatments, there was no sign of improvement as adjudged by slit-lamp examination. Insulin was recommended, but at first was not used because the patient's doctor was disinclined to give it. After another six weeks, as no sign of improvement was evident, injections of insulin were given. The ulcer started to heal and within about two or three weeks the whole excavation was filled in with epithelium to the level of the normal corneal contour. This was four months ago: the eye has remained quiet and normal since."

CASE 5.—A man with severe herpes frontalis. The right eye was blind from an old injury. The left eye showed an ulcer extending over most of the cornea except for a small area above the pupil up and in. Some blood-stained hypopyon was present and the iris vessels injected. The tension was raised and there was chronic conjunctivitis.

The lids were painted with 1 per cent. silver nitrate, and he was treated with albucid drops and albucid by mouth. Five units of insulin were given daily. There was no improvement for two days, but on the fourth day, when I asked a colleague to see him with a view to getting an opinion as to whether a tarsorrhaphy should be done, we found the cornea healed. No carbolizing had been done. A slight relapse took place a few weeks later but healing again occurred and has been maintained.

I have quoted only a few cases, more or less as samples. Insulin may possibly have been used before in ophthalmology, but I have no references available. Since the war there has been

at least one mention in the *British Medical Journal* of its use in promoting more rapid healing of extensive wounds of the limbs, and my house surgeon has recently called my attention to a very brief reference to its use in indolent ulcers. (Pye's Surgical Handicraft.)

There would appear to be some scope for further investigation of its action in hospitals with more abundant material and facilities for controlled experiments.

Three possibilities suggest themselves to me. Either insulin improves the patient's nutrition, or removes some factor necessary for germ-metabolism, or it increases the rate of epithelial proliferation. If so it may be worth a more extensive trial in war surgery as well as ophthalmology.

TWO RARE CASES OF HOMOPLASTIC SURGERY OF THE EYELIDS*

BY

N. I. SHIMKIN

HAIFA, PALESTINE

Two successful cases of homoplastic surgery of the eyelids are described, both having unusual clinical features.

The first case.—Post-trachomatous trichiasis in a haemophilic youth was treated by a graft from the buccal mucous membrane of his father. In the ophthalmic literature which I have consulted, I have not been able to trace a single similar case.

The second case.—Four lid ichthyosis ectropion in a baby of 13 months suffering from a congenital generalised ichthyosis was treated with whole skin grafts from the forearm of his mother. Four lid ectropion in congenital ichthyosis has been seldom described but Elschnig[2] reports a successfully treated case in 1912, published in 1923.

Case I

The patient, a Moslem Arab, aged 22 years, of good general condition, consulted me on January 28, 1944. On examination :— Right eye : Trachoma III. Pannus levis, central nebula, vision —6/60. Left eye : Blepharospasm, photophobia, trachoma III, trichiasis gravis, pannus crassus ulcerosus. Vision : hand movement before the eye.

The patient was advised to be operated on for trichiasis. He consented and asked for the operation to be performed immediately, as he was afraid of losing the sight of the left eye altogether.

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The operation.—On January 28, 1944, at 2 p.m., the grafting operation was successfully performed at my eye surgery under a local anaesthetic. The transplant was taken from the mucosa of the lower lip of the patient. The operation passed off without any complications. As usual, no sutures were used, neither on the lid, nor on the implant, which was carefully inserted and fitted into the intermarginal incision. The patient was ordered to return to the surgery on January 30.

On January 29, 1944, very early in the morning, the patient accompanied by his father, came unexpectedly to me at my home. His outward appearance was frightening, his head was covered with a blood-stained scarf, as worn by Arab peasants. The dressing over the eye was soaked with blood, which was also oozing from under the bandage. He was also spitting blood continuously. The father, seeing my amazement, explained that his son, even after the slightest injury to a finger would bleed for weeks, and that he had told him to inform the surgeon of this fact. The son, however, had withheld this information for fear that he would not be operated on. The father also said that his wife had two sons by her first husband. One had died after circumcision as practised by Mohammedans. The other son at the age of 2½ years fell and knocked out three front teeth. Bleeding could not be arrested, and ten days later, the child died from loss of blood. Two brothers of his wife also suffered from haemophilia. One had died at the age of 19 years from continuous haemorrhage following a head injury. The other was still alive, and was now 42 years of age; from the slightest wound, he would bleed for a long time, though bleeding would eventually stop. This history revealed that my patient was a hereditary haemophiliac. As no medical treatment is of any value, it was decided to sew down the implant if it still lay in its bed. When the dressing was taken off, the implant was lying among the blood clots. Having cleaned the wound of blood, and freed the implant from the clots, I put it into the wound again, and fixed it to the exterior edge of the incision, by means of three loop sutures. The lip wound was closed with five knot sutures, and an occlusive bandage applied to both eyes. The patient and his father were told that if the dressing did not again become saturated with blood, he should come only in 2 days time.

On January 31, 1944, the patient came, accompanied by his father and mother. The dressing was again saturated with blood. The mother related that the bleeding from the eye had begun the night before, but that the bleeding from the lip wound was considerably less. But during the night the eye had bled to such an extent that the whole pillow was soaked. When the dressing was removed it appeared that the implant had again been dislodged by the underlying blood clot. There was nothing to do but to remove the implant and to sew tightly the edges of the incision, and

in this way to stop the bleeding. But by this means, the trichiasis would not have been corrected, and the patient would have remained in the same condition as he was before the operation. To attempt another method of operating for the trichiasis was also impossible, as with any wound to the skin of the lid or tarsus (*e.g.*, operations of Snellen, Hotz-Anagnostakis and others), the bleeding would have started again.

There only remained to try and see if the father's blood would coagulate the blood of the son. The father consented. When the father's forefinger was pricked, the blood was made to drop straight into the wound on the intermarginal space, his finger actually touching the wound. With this, the bleeding from the eyelid stopped after the wound had been touched three times in as many minutes. Seeing that the father's blood coagulated the blood of the haemophilic son, I decided to take a mucous graft from the father's lower lip. The father consented and on the same day a piece of mucosa was taken from the father's lower lip, under local anaesthesia (drops of 5 per cent. cocaine hydrochlor.) and put into the intermarginal incision of the lids. Anaesthesia of the lids of the patient was obtained by means of injection of 2 c.c. of 4 per cent. hillcain solution with adrenaline. The graft was carefully fitted to the wound. No sutures were applied either to the lids of the patient or to the father's lip. Both eyes were bandaged. Father and son were sent away and told to come in two days time.

On February 2, 1944, the patient was brought by his mother, who said that the dressing had remained dry all the time. When the eye was opened, the graft was found to be lying in its bed, and looked as well as any mucous transplant used for a normal graft. Red protonsil 5 per cent. ointment was again inserted and a dressing applied to both eyes. From the patient's lip wound which had now been sewn up, there was still some light bleeding. The mother said that the father's lip had bled only very slightly, and he had gone to work the same morning. The patient was told to return after two days.

On February 4, 1944, the patient was brought by the mother who said there were no signs of bleeding on the bandage, and that the patient wanted to use the eye which had not been operated on. When the dressing was taken off, the implant was found in good position; its colour, as with all mucous grafts was pinkish-red. The patient could freely open his eye. Atropine 1 per cent., red prontosil ointment 5 per cent., between the lids, and sulphanilamide, 2 tablets t.d.s. were prescribed. This time a dressing was applied only to the left eye, and the sutures were removed from the lip, from which a little bleeding occurred, and a mouthwash of hydrogen peroxide was given. (Further routine treatment for trachoma was carried out: 6 tablets of sulphanilamide daily, 2 tablets t.d.s. and atropine 1 per cent.)

On February 8, 1944, the patient was demonstrated at a meeting of the Haifa Jewish Medical Association. Since the surgeons who were present expressed a doubt concerning the final results, the patient was demonstrated again the following week. The isograft or homograft was lying in its bed, its colour normal, pinkish-red.

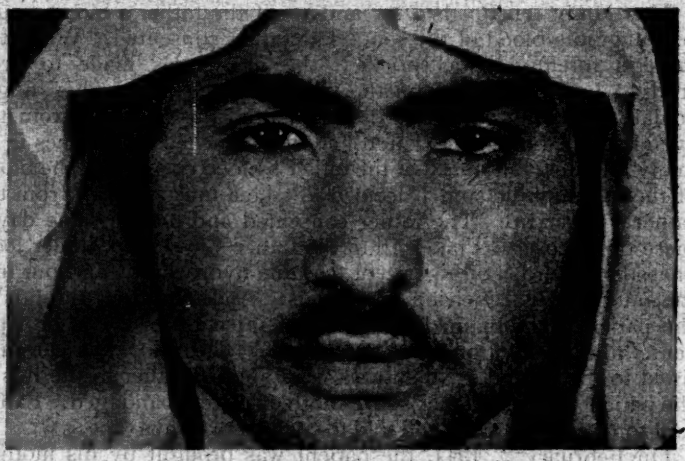

FIG. 1.

One month after operation. *Left eye.*—Post trachomatous trichiasis in a haemophiliac, corrected by graft from his father's mucous membrane.

The lid showed a complete correction of the former trichiasis, vision was 6/24, pannus ulcerosus had disappeared (see Fig. 1 for photograph of patient, one month after operation).

Conclusion.—Persistent bleeding in a haemophilic youth was controlled by the blood from his father. An isograft taken from the father's buccal mucous membrane transplanted perfectly and corrected the trichiasis in his haemophilic son.

Case II—Ichthyosis congenita with four lid ichthyosis ectropion

Review of literature.—The four lid ichthyosis ectropion in the cases of congenital ichthyosis is rare, because such children usually die in their first year.[3 and 4] In the *British Journal of Ophthalmology,* since 1916, no such case has been recorded. Neither is there any mention of ectropion ichthyosis of all four eyelids in the French literature till the year 1939. (*Traité d'ophtalmologie,* Vol. I, p. 8, 1939.)

In the old German literature collected by Groenow,[5] covering the period from 1886 up to 1920, he mentions his own case of ichthyosis ectropion only of lower eyelids in a man 45 years old, and also several cases of slight ectropion accompanied by changes in the cornea.

During the last 20 years, I have found in the new German literature only two cases similar to the one I am about to describe. In February, 1923, Sondermann[2a] described a complicated case of ectropion caused by congenital ichthyosis, in a boy of 13 years suffering also from a perforated corneal ulcer e lagophthalmo. The boy died from tuberculosis a month after the article was published, but Sondermann concluded it by advocating as early an operation as possible to correct the ectropion.

In the above mentioned article Elschnig[2] recorded that as early as 1912, he had performed a plastic graft on all four lids in a patient of 9 years, and although 11 years after the operation, ichthyosis developed on the implant, the function of closing the eyelids remained good. The graft in this case was taken from the inner side of the forearm of the patient's sister, three years his senior.

On account of the rarity of the case I have thought it worth while to describe it in detail.

On September 1, 1943, Dr. Ostrovsky, a specialist for Infants' Diseases of the Hadassah Hospital, Haifa, sent me a child suffering from ichthyosis congenita. The boy, 13 months old, was the fifth child of healthy parents (Moslem Arabs). The four older children were born healthy, and had no abnormalities of the skin. This fifth child was born normally, but since his birth, his whole body was covered with a hard scale-like skin looking like crocodile leather. In general the child ate and put on weight normally. The only reason why the mother sought the advice of an eye specialist, was that on the slightest crying, the child's upper lids would turn outwards and " red flesh " would cover the eye.

On examination.—The body of the child was covered with hard skin as if with brown fish scales (ichthyosis nigricans); the colour of the scaling resembling that of the broken skin of a baked apple. When examined the child started crying, and both upper lids turned outwards, as with spastic ectropion in scrofulous children suffering from acute conjunctivitis. When the child calmed down, it was observed that the edges of the upper and lower lids were raised from the eye-ball and their posterior borders were not in contact with the globe. The reason for the " non contact " was the parchment-like, non-elastic skin of the upper and lower eyelids, which did not allow them to fit closely to the eyeball, pulling the edges of the upper lids upwards, and those of the lower downwards. The same thick hard skin covered completely the whole body of the child.

As the turning outward of the eyelids happened every time the child cried, so the conjunctiva thus exposed to the atmosphere, dust, etc., naturally looked like "red flesh" and frightened both the mother, father and anybody who saw the infant in such a state. It was clear that in order to correct the spastic ectropion it would be necessary to separate, at the lid-margin, the thick parchment-like skin from the underlying lid-tissues by inserting a skin graft. But, as the skin on the whole body of the child was not normal, I had to suggest that the mother should give some skin from her forearm for grafting her child's eyelids. Her consent being obtained, I started the operation.

On September 1, 1943, the operation passed off successfully without any complications. The lids and grafts after the operations were dusted with sulphanilamide powder, and covered with 5 per cent. red prontosil ointment; occlusive dressing was applied to both eyes. In view of the fact that the patient's pulse became arhythmic, the grafting of the lower lid of the left eye was postponed.

On September 3, 1943, *i.e.*, on the second day after the operation, the dressing was changed for the first time. The isografts were in their beds and seemed healthy.

FIG. 2.

Four lid ichthyosis ectropion corrected by whole skin graft taken from his mother's left arm. *Note.*—Red scar on the mother's upper arm (post secundam intentionem). Left lower lid of baby was not grafted.

On September 9, 1943, all isografts were in place and the child opened the lids without any difficulty, and when crying, his upper lids remained in the normal position. When closing the eyes, the lids were in complete contact with the globe on the right side. On the left side, the slight ectropion of the lower lid remained as it had not been corrected. The upper left lid though, was in complete contact with the globe. The child was sent home without a dressing. The mother was satisfied with the result achieved, and did not want another operation on the left lower lid.

On October 15, 1943, the mother brought the child again saying that the " red flesh " did not protrude out of the eyes any more, and that she was satisfied with his condition. She stressed again that she did not want to subject herself or the child to another operation for correcting the ectropion of the lower lid of the left eye. (See photograph taken on October 15, 1943.)

The child was brought for demonstration at the meeting of the Jewish Medical Association, Haifa, on November 21, 1943, *i.e.*, seven weeks later. The corrected lids were functioning perfectly and their colour quite satisfactory from the cosmetic point of view. According to the mother, the child was happier, and even when he cried, the lids did not turn outwards.

The thesis of McWilliams and others[1] " that isografts are valueless " does not apply to eyelid surgery. In fact under certain conditions an isograft may even be the method of choice.

The author gives a description of two very rare homoplastic operations on the eyelids: first operation till now was not mentioned in ophthalmic surgery, *i.e.*, the buccal mucous membrane of the father used to correct the trichiasis of his haemophilic son; and also only the second case in ophthalmic literature the whole skin graft of the forearm of a mother corrected the four lid ichthyosis ectropion of her child of 13 months old.

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TRAUMATIC LENTICONUS POSTERIOR*

BY

Captain EMANUEL ROSEN, M.C.

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IN 1913 Fisher[1] reported a case in the *London Ophthalmic Review* of traumatic posterior lenticonus. Upon investigation of this case several factors led Marsh[2] to assume that this was not a true case of traumatic lenticonus posterior. Fisher's patient was a physician about 40 years of age who sustained a " cricket ball " injury to his left eye. When first examined the patient complained of inability to read with his right eye at close range. The eye examination was essentially negative and since the patient's distance vision was 20/20 at this time, nothing was noted or recommended. However, when this patient was re-examined 15 months later the eye had become markedly myopic, requiring a correction of −5·00 D. sph. −5·00 D. cyl. 30°. At this time Fisher noted that a typical lenticonus posterior was present. The eye continued to get increasingly myopic and eventually became cataractous. In reporting this case before the society, Fisher stated that he had no doubt whatsoever, that this was a true case of traumatic lenticonus posterior.

However, Marsh[2], in his review upon lenticonus posterior in 1932, when discussing the various theories of lenticonus posterior, dismissed trauma as an aetiologic factor by stating that Fisher had no slit-lamp examination to substantiate his case presentation.

If by definition lenticonus posterior is a " congenital transparent, hemispherical prominence circular in outline, superimposed upon the posterior pole of an otherwise normal lens," then indeed it is difficult to include many cases with structurally abnormal posterior lenticular contour, but if by lenticonus posterior is meant an abnormal lenticular herniation so that there is disturbance in the symmetry of the curvature of the posterior capsule, then it is possible that this condition may result from multiple causes. I therefore wish to present two cases—definitely of traumatic aetiology which offer typical post phakal protrusion.

Case 1 is that of a young man aged 23 years who received a penetrating injury to the left eye following an explosion. The explosion occurred when the patient was about 5 feet from the missile, a non-magnetic foreign body entering the corneo-scleral junction at approximately eleven o'clock. A shiny calcium-like encrusted scar was present at this area. The iris corresponding to this same sector was atrophic, detached from its peripheral union, and tremulous. Transillumination was apparent at its base

* Received for publication, August, 1944.

CASE 1. (Narrow Beam)

CASE 1.

and its pupillary portion was chord-like. There was an adhesion of the iris to the anterior capsule of the lens at this same meridian. The path of the projectile could be followed along this same sector of the lens right through the thickness of the lens to the posterior capsule where at approximately eleven o'clock a very dense white deposit—almost chalky white—yet with a metallic lustre resembling white gold, was readily seen. The entire posterior

cortex seemed to be encrusted by small, white, round, salt like deposits very much resembling stars in the sky. The posterior capsule seemed to bulge posteriorly. The vitreous also seemed to partake of this star formation and in one area upon the nasal side —one small " star " seemed to move up and down with the movement of the eye. The slit-lamp picture illustrates the posterior bulge and the punctate lenticular and vitreous deposits.

Case 2 which I have previously reported as a case of " Chalcosis Lentis associated with traumatic lenticonus posterior "* also shows the prominent bowing posteriorly of the centre of the posterior capsule of the lens. In this case the posterior capsule appeared to be " rolled up " upon itself in two regions much like

CASE 2.

" glass leisen bodies " in the anterior chamber. This " rolling upon itself " of the posterior capsule resulted in glass like tubings which had the same effect when struck by the beam of light as does the edge of a dislocated lens. The capsular tubings took the shape of an aeroplane wing and can be seen in the slit-lamp picture. It is possible that in this case trauma has produced a process similar to lamellar separation allowing the capsule to roll up on itself and the region between these " tubes " to herniate because of its loss of resistance.

I have seen a third case which unfortunately I could not photograph, in which the posterior capsule showed a very slight bulge when examined in the zone of specular reflection. This bulge was so slight that it appeared to involve not more than a single layer and the entire region of the bulge was included in the section being viewed. This case was also one of an intra-ocular foreign body. I have had no opportunity of examining this patient again.

* To be published in *Archives of Ophthalmology*.

The "ring of fire" reflex described by Vogt in posterior lenticonus is possibly the result of such a "tube" formation and the play of light which it may produce. Whatever other secondary features are found associated with lenticonus posterior could follow intra-uterine trauma which in the light of these case reports must be given special consideration. If by definition these cases cannot be included under the term lenticonus posterior then perhaps they may be considered as traumatic post phakal protrusions.

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AN UNUSUAL TYPE OF ANTERIOR TRAUMATIC CAPSULAR CATARACT*

BY

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SOME time ago I had the good fortune to examine a patient who had walked into a limb of a tree which he did not see, thus striking his eye directly upon one of its pointed terminal twigs. Nothing was done for the eye that night—the eye was neither painful nor irritated. The next morning the patient visited his family physician who referred him to an eye specialist. He was immediately hospitalized, and for a period of two weeks drops were instilled in his eyes. After 48 hours the patient noticed a gradual diminution of vision in his left eye. He was told that he had sustained a penetrating injury of the cornea and that a traumatic cataract was developing.

One month after the original injury the patient appeared at my office. Several interesting slit-lamp findings were observed. A "thru and thru" irregular corneal scar was seen just about the centre of the cornea 1 mm. in size and shaped like a letter "V." The anterior capsule of the lens presented an elongated white opacification which was primarily scar tissue. (See Fig. 1.) There were several folds radiating from the main scarred mass of the anterior capsular cataract. (See Fig. 2.) The anterior chamber was rather shallow. The appearance of the radiating folds and the suggestion that the anterior capsule was thrown into multiple waves was so striking that a photograph was attempted which is shown in Fig. 2.

* Received for publication, August, 1944.

FIG. 1.

FIG. 2.

If it is characteristic for the various so-called glass membranes to be thrown into wavy folds as is seen in "wrinkles in Descemet's membrane" in severe forms of keratitis—then one would expect such waves to be more commonly seen in anterior capsular cataract. On the other hand the folds may be the result of radiations from an indented wound with epithelial proliferation upon the lens capsule and subsequent shrinkage with scar contraction and striae formation.

The case is presented primarily because of the photographic study and the speculation as to the nature of production of the radiating folds.

QUININE AMBLYOPIA WITH SPONTANEOUS DETACHMENT*

BY

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History.—Private F. T., aged 29 years. First reported sick on November 25, 1944, with general malaise, headache, anorexia for three days. Temp. 101°, Pulse 105. Admitted as P.U.O. and regarded as malaria because spleen was enlarged. Placed on quinine (dosage not recorded but assumed to be the usual gr. 10 t.d.s.). Temp. rose to 104°± and he became mentally confused. Blood slide negative for malarial parasites. On November 26 he became deaf, confused, pupils dilated and not reacting, temp. had dropped to 98°+. Quinine was continued. On November 27 temp. was still down, still confused, pupils still dilated and fixed, quinine was stopped and mepacrine begun. He was transferred to a general hospital, on admission (November 28)—confused and delirious with hallucinations and loosely organised delusional system; temp. 101°, spleen enlarged no organic nervous signs apart from pupils; lumbar puncture clear. Became very dehydrated and given 1V glucose and saline (5 pints).

Eye condition.—(Examined December 4—9 days after onset of illness.) Denies perception of light, pupils both semi-dilated but they do react sluggishly both directly and consensually, he blinks if a hand be moved before face care being taken to avoid air current exciting corneal reflex. Ocular movements normal.

Fundus. (R). Blurred edge of disc except temporally, not pale, arteries extremely small, they are scarcely visible away from the disc. (L). Disc is definitely pale particularly nasally, temporal edge a little blurred. Arteries as in R. eye. Inhalation of amyl nitrate had no effect on the calibre of the vessels.

Two days later the (L) retina was seen to be detached above the nerve head, 5.D., detachment limited to the area immediately above and extending from " 10 o'clock to 3 o'clock." Ergotamine ethanosulphate, 1 mgm. t.d.s., was started and continued for two days (no hole seen in detachment). On December 8 (13 days after onset and commencement of quinine) patient found he could see a little, O.E. (R) eye counts fingers at 1 metre, loss of colour vision (describes an orange as grey), field restricted to fixation, pupil still very sluggish, disc now getting pale, vessels as above. (L) eye vague p.l., only disc paler than (R), vessels and detachment as before. The picture is one of primary optic atrophy.

December 16 (21 days after onset). (R) = C.F. at two metres.

* Received for publication, January 25, 1945.

(L) = C.F. just. Detachment is shallower. Patient now quite rational since December 8 when vision returned. December 18 as above.

Discussion.—This case is thought worth reporting because of the detachment which occurred eleven days after the onset.

Diagnosis.—Rests between a toxic amblyopia due to quinine and retro-bulbar neuritis occurring in acute encephalitis. The history of quinine having been given, the vascular changes, the deafness and the residual extremely contracted fields favour quinine. There is no exact record of the exact amount of the drug given but he was on it for two—three days and the administration of thirty grains a day is standard treatment in the Army—so that it is reasonable to assume that he received between 60 and 90 grs. (It is a pity that he was kept on the drug in spite of the toxic signs seen within twenty-four hours.)

Treatment.—He was seen too late for paracentesis to have been of value. Amyl nitrate had no effect on the vessels, nor did the ergotamine ethanosulphate, the improvement which occurred after its administration was probably *post* and not *propter hoc*.

The detachment.—This was restricted to the worse eye and was only present in the area immediately above the disc, it extended upwards for a distance equal to one disc diameter, the lower edge overhung the upper margin of the disc, no hole was visible. The finding on December 16 (detachment shallower) was faulty, while under observation it did not vary.

Summary.—A case of severe quinine toxic amblyopia, with a spontaneous detachment and severe atrophy is reported.

A SIMPLE DEVICE FOR TESTING DIPLOPIA*

BY

Major I. C. MICHAELSON, R.A.M.C.

THE requisites of a suitable test object in investigating diplopia are as follows :—

(1) It should have a bright, easily recognisable appearance.

(2) Its form should be linear so that the smallest separation or tilting can be easily noted.

(3) It should be turnable to all directions so that vertical separation can be easily noted as horizontal cases.

The simple device illustrated serves these purposes. It fits to the Hamblin Ophthalmoscope lamp handle and consists of an arrow perforated tube closed at the top and cut-away in its posterior wall so that a flat sloping surface painted white reflects the internal light

* Received for publication, January 2, 1945.

to give the arrow an even illumination. A 10-inch string fixed to the top of the tube, marked with little pieces of metal into inches, and weighted at its free end gives the instrument the following additional advantages:—

(1) The distance between the false and the true images can be found by asking the patient to touch the arrow and then to point to

the false image. The surgeon measures by means of the string the distance between the arrow and the patient's finger. This obviates dependence on a sometimes dull patient's assessment. The inch spaced pieces of metal enable this to be done in the dark.

(2) The degree of tilting of the false image can be found by tilting the handle of the lamp until the false image is erect and then noticing by touch the angle between the handle and the dependant string.

This device has been used for some time and has been found useful. It is simple and has the advantage of always being at hand in that it is *not* "another instrument" but a simple fitting that can always be carried about in the ophthalmoscope case. It has been of particular help in the examination of bedded patients, especially those unable to sit up.

Messrs. Theodore Hamblin intend making this device an accessory to their Lister-Morton Ophthalmoscope as soon as the pressure of war work permits.

I wish to thank Capt. C. J. King, R.E.M.E., Officer Commanding Surgical Equipment Workshop, R.E.M.E., for his kind co-operation in making the instrument.

This report is made with the permission of Colonel W. B. Stevenson, R.A.M.C., Officer Commanding a General Hospital.

SUBCUTANEOUS SPLITTING OF THE LID IN THE OPERATIVE TREATMENT OF SENILE ECTROPION*

BY

H. LYTTON

LONDON

THE bugbear of the marginal splitting of the lid in the Kuhnt-Szymanowski operation is the late development of trichiasis as the marginal scar tends to pull the canals of the lashes inwards. Another drawback is the frequency of the cutting through of tarsal sutures.

The following method avoids the splitting of the lid margin, while giving sufficient control of the extent to which the lid margin is inverted.

The skin-muscular layer of the lid is separated from the tarso-conjunctival layer by subcutaneous splitting from the incision AB at the outer canthus (Diagram 1).

The splitting of the lid is best done by an angular pair of scissors, and should be extended up immediately underneath the lid margin keeping close to the anterior surface of the tarsus.

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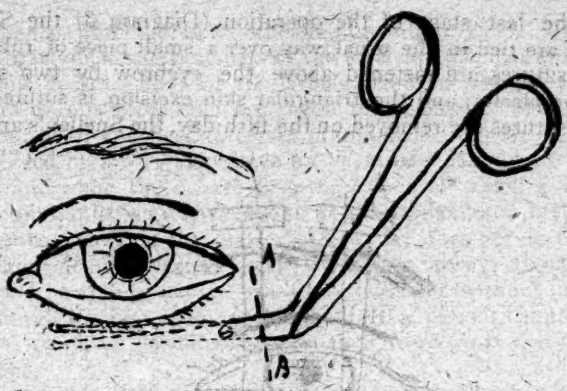

DIAGRAM 1.

Subcutaneous splitting of the lid.

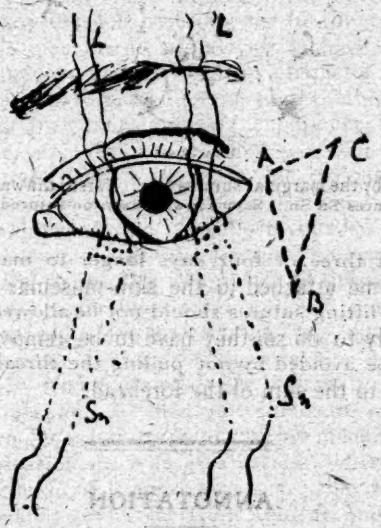

DIAGRAM 2.

Insertions of sutures. Completion of the incision AB to the Szymanowski triangle ABC.

Two mattress sutures LL (Diagram 2) are inserted in the anterior layer of the lid near the lid margin. These sutures are used to lift the skin. The tarsal plate is drawn down and in by two Snellen's sutures SnSn. The lateral incision AB is completed to the excision of the Szymanowski triangle ABC.

In the last stage of the operation (Diagram 3) the Snellen's sutures are tied in the usual way over a small piece of rubber, the lifting sutures are fastened above the eyebrow by two strips of adhesive plaster, and the triangular skin excision is sutured. The lateral sutures are removed on the fifth day, the Snellen's and lifting

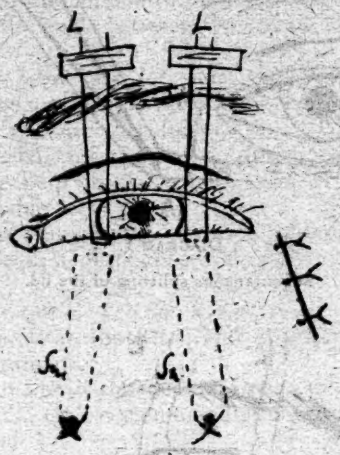

DIAGRAM 3.

Skin lifted by the marginal sutures LL. Tarsus drawn down by the Snellen sutures Sn Sn. Szymanowski excision sutured.

sutures are left three or four days longer to make sure that the tarsus has become attached to the skin-muscular layer at a lower level. The lid lifting sutures should not be allowed to cut through. If they are likely to do so, they have to be removed. This inconvenience may be avoided by not pulling the threads too taut when fastening them to the skin of the forehead.

ANNOTATION

Fees

From the ophthalmological point of view a fee is a reward for professional services and we need not consider the meaning of the word with regard to feudal land tenure, or that of a tribute to a superior. It is of interest to note that the shorter Oxford Dictionary gives, amongst other meanings, " payment to a public officer (? orig. one who held his office in fee) for the execution of his functions,

1450; hence, professional or other remuneration, 1583." Johnson alludes to payments to members of the legal and medical profession. But while fees to lawyers are largely fixed in amount those to members of our profession are much more elastic. We think it would not be in the best interests of the profession for fees to be standardized by law. They have for years been largely a matter of custom, and while there have been occasions in which a member of the community may have undercut his professional brethren in the neighbourhood in the matter of fees, he does not in the long run do himself much lasting good. We have always thought that one should be able to charge what fees one likes without incurring the odium of the rest of the profession. If a patient cannot afford full fees we never hesitated to take their word for it and to make reductions.

One supposes that one gets taken in occasionally, but taken as a whole the vast majority of patients meet their obligations in an exemplary manner. Some there are who never mean to pay their fees. As a general rule these are not worth powder and shot, and that is why so few of such cases appear in the courts. It would have puzzled the most astute of lawyers to have got a fee out of Mr. Harold Skimpole; and that type of character is more likely to try and obtain a loan from his doctor than to think of paying his just debts. Our own most amusing experience in the matter of fees was in our very early days when we were consulted by a neurasthenic curate. He took up a lot of our time and was obviously very absent minded. When he came to settle up he produced an envelope, saying "I believe your fee is two guineas." Being a parson's son, we always let the junior members of the cloth down lightly, so we said, "yes, but in the case of the Clergy we usually make a reduction to one guinea." He was profusely grateful and removed what we imagined was one of the guineas; but on inspecting the contents of the envelope after he had gone we found that he had abstracted the pounds and left us with a couple of shillings, and we had not sufficient moral courage to pursue him down the street to point out his mistake.

On another occasion the wife of a patient, whom we always saw at half rates, brought a friend to see us. She was dressed very poorly and appeared to be far from affluent, and we thought we were lucky to get our half fee, until we came to show them into the street, when the patient got into one of the largest motor cars we have ever seen and was driven serenely off by a chauffeur in uniform.

ABSTRACTS

MEDICAL OPHTHALMOLOGY

(1) **Ormsby, O. S. (Chicago).—Dermatologic lesions about the eyes.** *Amer. Jl. Ophthal.*, Vol. XXVI, p. 850, 1943.

(1) **Ormsby** describes the clinical features of such skin disorders as ocular pemphigus, ectodermosis erosiva pluriorificialis, the triple symptom complex, ocular avataminosis, contact dermatitis, xanthelasma, pseudoxanthoma elasticum and angioid streaks and lupus erythematosus in association with ocular lesions.

This abstract gives a brief outline of two of these which it is probable are less well known to eye specialists. (1). Ectodermosis erosiva pluriorificialis. This disorder resembles erythema multiforme. Its onset is acute with chills, headache, malaise and a rise of temperature 102°—104°. Stomatitis begins with vesicular lesions and pseudo-membrane formation which may extend to the pharynx and epiglottis. The mucosa of the nose, uretha, vagina and anus may be affected. The eye signs are bilateral vesicular conjunctivitis which in mild cases clears without sequalae. In severer cases sight was severely affected. Vesicles, erythema and later crusting appeared on the hands and feet. The course of the disease was 3 to 6 weeks. Relapses are reported.

(2). The triple symptom complex shows aphthous ulcers in the mouth, ulcers on the genitalia, retinitis and iridocyclitis. The skin lesions resemble erythema nodosum. The disease has an indefinite course, its severity is variable and it recurs. A virus is suspected as the cause.

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(2) **Rosenbaum, H. D. (Fort Leavenworth, Kansas).—Varicella and the cornea.** *Amer. Jl. Ophthal.*, Vol. XXVI, p. 53, 1943.

(2) **Rosenbaum** reviews the literature about ocular lesions associated with varicella. The following have been recorded:— a phlyctenular or vesicular type of conjunctivitis; bilateral superficial keratitis; leucoridia (pearl-coloured round spots devoid of pigment on the iris stroma).

The author describes the case of a military student with a corneal erosion affecting the right eye which appeared on the 16th day of varicella. On the posterior surface of the cornea opposite this there were some infiltrations in Descemet's membrane and the endothelium. There was some degree of anaesthesia in this case. The latter disappeared in 10 days.

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(3) **Eckardt, R. E., Stolzar, I. H., Adam, A. B. and Johnson, L. V. (Cleveland, Ohio).—The pigment of the Kayser-Fleischer ring.**

(3) **Eckardt, Stolzar, Adam** and **Johnson** comment that the pigment in the cornea staining a Kayser-Fleischer ring may vary from case to case. It is complex as regards cations. They subjected the altered corneae to spectrographic analysis. Abnormal cations common to both cases were zinc, copper and iron. The cornea of one case showed aluminium and silver.

Two cases of Wilson's disease with typical Kayser-Fleischer rings are reported. Both came to autopsy.

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(4) **Schwarz, G. T. (Cleveland, Ohio).—Case report of congenital grouped pigmentation of the retina with maculocerebral degeneration.** *Amer. Jl. Ophthal.*, Vol. XXVI, p. 72, 1943.

(4) **Schwarz** reports the case of a six year old white boy retarded in general intelligence, with manual deficiency, an alternating squint and left inguinal hernia. Small spots and flecks of pigment beneath the retinal vessels were noted in the periphery of both fundi. Pigmentary degenerative changes were also present at the maculae. The child's movements in a darkened room showed no evidence of abnormal reduction of acuity with reduced illumination.

Muscle volume was subnormal. All reflexes except the cilio-spinal were present, the radial, ulnar and suprapatellar reflexes were sluggish. There was difficulty in phonation. A diagnosis of maculo-cerebral degeneration was made.

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(5) **Lehrfeld, L. and Brav, S. (Philadelphia).—Angioid streaks of the retina.** *Amer. Jl. Ophthal.*, Vol. XXVI, p. 1222, 1943.

(5) **Lehrfeld** and **Brav** describe two cases of angioid streaks associated with pseudoxanthoma elasticum occurring in sisters. In the literature only 17 cases of the familial occurrence of this syndrome have been reported; in four of these there was consanguinity. The authors quote Scholz who found that pseudoxanthoma elasticum was present in 59 per cent. of cases with angioid streaks. Osteitis deformans (Paget's disease) has been reported in association with angioid streaks, but never concurrently with pseudoxanthoma elasticum.

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(6) **Johnson, R. H., Harley, R. D. and Horton, B. T.—Arteritis of the temporal vessels associated with loss of vision.** *Amer. Jl. Ophthal.*, Vol. XXVI, p. 147, 1943.

(6) **Johnson, Harley** and **Horton** report two cases of arteritis and periarteritis affecting the temporal arteries. These vessels show hard cord like thickening, easily palpable nodes and painful tender

areas over the temple and scalp. Other symptoms and signs are headache, general malaise, lassitude, weakness, fever, night sweats, anorexia, loss of weight, anaemia and mild leucocytosis.

In one case, a woman aged 61 years, visual loss in her left eye was due to occlusion of the upper branches of the central retinal artery and veins, and ischaemic oedema of the optic disc. In the right eye there was visual field loss in the superior nasal quadrant and general constriction of the field. Ischaemic areas were present along the superior temporal vessels. In the second case also there was ophthalmoscopic evidence of a vascular lesion affecting the arterial supply to the retina, but the site of the lesion was apparently retro-ocular.

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(7) **Alois, B. Y. and Toland, V. A. (Saint Louis).—Naevus flammeus associated with glaucoma.** *Amer. Jl. Ophthal.*, Vol. XXVI, p. 720, 1943.

(7) **Alois** and **Toland** report the case of a boy, aged 14 years, suffering from naevus flammeus on the right side of his face following the distribution of the first and second divisions of the trigeminal nerve. The intra-ocular pressure of the right eye was 43 min. Hg. There was a small posterior capsular lens opacity and the optic disc was deeply cupped. Miotics reduced the tension temporarily. Later it was necessary to do a trephine operation. After this the intra-ocular pressure remained normal for ten months. It rose again, pilocarpine was without effect but suprarenin ointment with miotics controlled the tension for six months until it rose again.

A perforating cyclo-diathermy operation was performed over the upper half of the ciliary region. At operation a sheath of teleangiectatic blood vessels lying in the sclera and beneath Tenon's capsule was found encircling the globe. It began 2 mm. behind the limbus and extended as far posteriorly as could be observed through the incision. The tension remained normal for one month, then rose again. Cyclodiathermy was then performed over the lower half of the ciliary body. The tension fell to zero, and the optic disc became oedematous. The oedema cleared and the tension rose to 13 mm. Hg.

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(8) **Windham, R. E. (San Angelo, Texas).—A case of exophthalmos in a newborn infant.** *Amer. Jl. Ophthal.*, Vol. XXV, p. 1236, 1942.

(8) **Windham** reports the case of a male infant, 10 days old, with severe left exophthalmos. This appeared on the sixth day after birth and had progressed gradually. All investigations were negative. Marked recession occurred and the author atributed this amelioration to X-ray examination. The infant was referred to a radiologist for deep X-ray treatment. Twenty days after the initial examination the exophthalmos had disappeared and the eye appeared to be normal.

H. B. STALLARD.

BOOK NOTICE

Neuro-ophthalmology. By DONALD J. LISLE. Pp. 395. London: Bailliere, Tindall and Cox.

On the dust cover of this compendious work, it is suggested that heretofore it has been necessary for the ophthalmologist to refer to copious text books on neurology in order to glean, with time consuming energy, that which pertains to his speciality. The author's object has been to do this gleaning for him and to present this vast subject matter, correlated into a working unit of some 320 pages. He has achieved this object in several different ways. A bibliography containing 1,718 references gives an indication of one method which has been employed. The incorporation of 130 case histories shows, however, that the author has not been content to rely entirely on the writings and opinions of others and the same is true of his observations on anatomy since these are illustrated by numerous drawings and photographs which have been made chiefly from his own dissections. Illustrations are a notable feature of this book, and number no less than 234, many of them occupying a full page, and containing several diagrams and photographs. As an example, one may take illustration 215 which shows Benedikt's red nucleus syndrome. This comprises a small sketch demonstrating lateral deviation of one eye, a macroscopic view of the whole brain showing the location of the red nucleus in reference to other parts and a magnified section showing the relations in more detail.

Since neurology is mainly a rationalisation of the anatomy of the central nervous system, a large part of this book is devoted to this subject and it is treated with a wealth of detail seldom found in a work dealing with the clinical side of medicine. To some ophthalmologists this might seem to be overdone but it is justified when the reader goes through the descriptions of cases though it may take his mind back to those days of didactic teaching and frenzied learning which preceded his attempt to satisfy the examiners for the 2nd M.B. or the primary F.R.C.S. In fact when reading it he may feel the same guilty surprise as did the reviewer at having surmounted these hurdles which contained so many unsuspected and unknown thorns.

Neuro-ophthalmology is divided into 19 chapters which deal serially with the various nerves and portions of the central nervous system connected with the eyes and their muscles; with their blood supply and with the cerebro-special fluid system. There are additional chapters dealing with meningitis, syphilis, encephalitis, demyelinating disorders, neoplasms and a particularly valuable one on "syndromes which include eye disorders." The final chapter describes the eye manifestations of head injuries. The scope of the book will thus seem to be wide and no one who has read it will deny that the author has done justice to his subject and has produced a valuable contribution to ophthalmic literature. The

inclusion of a number of stereoscopic fundus photographs lends interest to the illustrations, particularly of conditions such as papilloedema. With a little practice it is possible to fuse these without a stereoscope and to see the disc literally standing out. It is a pity, however, that in the non-stereoscopic illustrations, the author should have relied to such a great extent on photography because many of the conditions would have been better illustrated by drawings even if these had to be reproduced in monochrome. We would like to congratulate him on giving credit to Leslie Paton (mis-spelt Patton) for having been the first to describe the Foster Kennedy syndrome.

It would take more space than can be allocated to a book review in this journal to name all the good points in this book, but two further ones deserve mention—the useful series of tables and in addition to the photographs, the admirable series of drawings, most of which show the brain *in situ* in the skull and so aid the reader in orientation of the parts shown.

CORRESPONDENCE

ALBUCID PASTE IN LACRYMAL OBSTRUCTION

To the Editors of THE BRITISH JOURNAL OF OPHTHALMOLOGY.

DEAR SIRS,—The results of probing in cases of chronic obstruction of the naso-lacrimal duct are not satisfactory, cicatrisation and stenosis recurring frequently. I have recently been trying a 10 per cent. sod. sulphacetamide (albucid) paste which is injected into the sac and duct after the latter have been probed, and the results have so far been most gratifying. As I do not see a sufficient number of these cases in my present "practice" to assess fully the value of this technique, I have thought it worth while to bring it to the notice of others who might care to try it. I also found it valuable in the pre-and post-operative treatment of a case in which I performed a dacryocystorhinostomy. (The sac in this case had become empyematous with rupture and fistula formation on to the cheek after an accident which fractured the maxilla and occluded the naso-lacrimal canal).

The base for the cream is:—

	Per cent.
Lanette wax	25
Sod. Sulphoricinate (Turkey red oil) ...	1
Paraf. molle.	12½
Aq. steril. ad	100

The sod. sulphacetamide used is the usual 30 W/V solution, 3·3 c.c. of which is made up to 10 grams with the base.

The paste so formed is of a creamy consistency, and passes through a lacrimal canula quite easily with only slight pressure. Its semi-solid consistency probably acts like a bougie and helps dilate the passages, and the sulphacetamide is retained longer in contact with the affected tissues. The use of penicillin instead of, or in conjunction with, the sulphacetamide in the paste would no doubt be an advantage. I have not had the opportunity to try it out.

Yours truly,

E. EPSTEIN, Major, R.A.M.C.

MILITARY HOSPITAL,
YORK. *April* 27, 1945.

MYDRIATICS IN THE EYES OF WEST AFRICAN NEGROES

To the Editors of THE BRITISH JOURNAL OF OPHTHALMOLOGY.

DEAR SIRS,—Having practised in Southern Rhodesia for the last 16 years, where I have been consultant in ophthalmology at the native hospital, I would like to comment on the article by Major J. Graham Scott on the "Eye of the West African Negro." I do not agree that homatropine hydrobromide 2 per cent. with cocaine hydrochloride 2 per cent. has no effect on the African. Certainly after the usual half hour there is no dilation, but after two hours or longer the pupils are dilated. This is rather an important point, because atropine will incapacitate the patient for any close work from 5 to 10 days, and he also has his value on the labour market.

Yours faithfully,

LOUIE A RUBIDGE.

STRACHAN'S BUILDINGS,
BAKER AVENUE,
SALISBURY, S. RHODESIA.
March 16, 1945.

NOTES

Deaths

THE untimely death of Dr. K. J. W. Craik, Fellow of St. John's College, Cambridge cuts short a brilliant career. Primarily a psychologist and philosopher, his knowledge of mathematics and physics, combined with his skill as an experimentalist, enabled him to accomplish researches of the greatest value and reliability. His Ph.D. thesis on "Visual Adaptation" dealt with the effects of adaptation on visual acuity and subjective brightness. The experiments showed much originality, and the analysis of the results led to physiological, psychological, and philosophical deductions of profound importance. Adaptation resembles mathematical differentiation, and permits us

to see objects as they more "really" are, by compensating for changes in external illumination. This mathematical conception of sensory processes was elaborated into a general philosophical theory in his Fellowship thesis, subsequently published by the Cambridge University Press. Dr. Craik's abilities were put to good use during the War under the aegis and encouragement of Professor F. C. Bartlett. His enthusiastic and laborious work on night vision and other war problems have been of the greatest value to ophthalmology and to the country, and led to his appointment by the Medical Research Council to the directorship of a unit for Applied Psychology at Cambridge. His personal charm made him persona grata to all with whom he came in contact.

As we go to press we learn with deep regret of the death of Mr. N. Bishop Harman, on June 13, 1945.

* * * *

Oxford Ophthalmological Congress The thirty-first annual meeting will be held at the Department of Human Anatomy, Oxford, July 5, 6, and 7, 1945.

A discussion on injuries to the eyeball, excluding intra-ocular foreign bodies will be opened by Mr. Alex. MacRae and by Mr. Charles Rudd.

Dr. Bernard Samuels, of New York, will give a demonstration of changes in the lens attributable of different pathological lesions. Mr. Gayer Morgan has a paper on a case of crush injury of the the chest associated with ocular complications, and Mr. F. O. Walker, a paper on a case of hydrophthalmos. The annual dinner in the Hall of Somerville completes the arrangements for July 5.

On July 6, Wing Commander Doggart has a paper on the prognosis in macular lesions, and Mr. John Foster one on his conclusions from 9,000 out-patient cases.

The Doyne Memorial Lecture on "involvement of the optic chiasma and optic nerves in cerebral gliomas," will be given by Professor Geoffrey Jefferson. Papers in the afternoon include ones by Mr. H. M. Traquair, Mr. Affleck Greeves and Mr. Humphrey Neame. Tea will be taken at the Oxford Eye Hospital.

On July 7, after the annual general meeting, there will be papers by Professor Ida Mann, Professor W. J. B. Riddell and Dr. R. Jarman.

Further information can be obtained from the Hon. Secretary, Mr. F. A. Anderson, 12, St. John's Hill, Shrewsbury.

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Special Notice WE are asked by the Ministry of Information to state that the fact that goods made of raw materials in short supply owing to war conditions are advertised in this journal should not be taken as an indication that they are necessarily available for export.